The Builder.

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A New Chapter in Art.

IT may seem bold, if not paradoxical, to announce the opening of an entirely new chapter in the history of art; and yet it is an announcement which appears to us to be justified. Recent discoveries, not in one field alone, but in several, are at once so novel and startling in themselves, and so suggestive of the probability that they are only the precursors of more of the same kind, that they demand the serious and unprejudiced attention of those who seek to view art from the high stand-point of its relation to ethnology.

The first of the recent acquisitions of modern research to which we have to refer is the very remarkable *terra cotta* sarcophagus which has just been added to the treasures of the British Museum. It is one of the articles purchased (or rather that we trust will be purchased) of the indefatigable collector and discoverer, Signor Castellani. The extraordinary peculiarity of this sarcophagus lies in the fact that it preserves with great fidelity two entirely different ethnological types, and that it represents a relationship between the races thus typified of which we are, as yet, quite at a loss to offer any historical explanation.

Of the two ethnological types thus reproduced, one is Greek, and Greek of a period not later than that represented by the Phygaleian marbles. The pure classic outline of the faces is unmistakable. So is the graceful fall of the folded peplum. The round shields borne by the warriors are like those with which we are so familiar. The helmets are representations of delicate work in metal, and the cuirasses also seem to be intended for bronze, and not for the armour of boiled leather, which takes the very indentations of the human form. The proportions of the figures are squat, the heads are small, and the drapery resembles that depicted on early Greek vases.

The second type we may perhaps be justified in terming Phœnician. It is, at all events, Asiatic, and, in our opinion, Semitic. The nose is aquiline, the chin prominent, the mouth narrow, but with protruding and freely opening lips, on which a perpetual smile seems to dwell. The beard and whiskers are so trimmed as to present a crescent on each side of the face, giving the effect of the profile that is sometimes drawn within the disc of the moon—the moon god, not crowned with the crescent, but wearing the crescent as a sort of bonnet or helmet. The figures thus characterised are totally or nearly nude.

But the most remarkable consideration remains to be noted. It is that the Greek figures appear in the subordinate rank. The nobly-draped women are standing as if in attendance on the seated Asiatics, who appear to be enjoying themselves without restraint. If the Greeks are not slaves, the only explanation that occurs would be that of honour shown to some foreign visitors of importance; but in almost each instance the Phœnicians occupy the post of honour.

On the lid of the sarcophagus a nude, spare, and boldly-modelled man reclines on cushions, which have been adorned by a sort of tesselation in the clay before it was burnt, as in the Henri Deux ware. A partially-draped female, of the same type, squats, in Indian fashion, by his side. We can hardly doubt that we have the portrait of the person for whom the sarcophagus was made, together with, perhaps, that of his wife.

Modelled *relievi* adorn each side of the sarcophagus, and it is in these that the two types, of which we are speaking are brought into relation. At the foot is a medallion, containing six figures, two of which are armed with the round shield, and are evidently Greek warriors. At the back of the sarcophagus is a representation of two Phœnician figures, seated on a couch, who are apparently the same as the full-sized figures in the round on the lid. On either side of the couch stand two draped Greek females, holding different implements, and apparently in attendance on the feasting Asiatics. On the head of the sarcophagus are four figures, seated on thrones, and apparently weeping in great distress. These are also Greek. Lastly, on the front is a relief containing numerous figures, the centre of the group being composed of two warriors, like those at the foot of the sarcophagus, fighting hand to hand. A nearly nude Phœnician male stands on each side. The subject of the two last relievi we take to be the mourning at a funeral, and the performances of combats, by way of funereal games. Whether the feasting scene be a funereal feast or the representation of an apotheosis, or state of happiness after death, may be doubtful; but the appearance of the nobler type of mankind, engaged either as gladiatorial combatants or as attendants on a feast, and the depiction of these scenes by artists whose sympathies are evidently with the non-classical type, are subjects of the deepest interest, and excite a curiosity which it is not easy to gratify.

The sarcophagus was discovered in a tomb, but not buried in earth, at Cervetri, the ancient Cære, in Etruria. This city, which had historic relations with Asia Minor, preserved its independence until the time of the siege of Rome by Brennus, after which its people enjoyed the privilege of Roman citizens, in gratitude for the hospitality which they offered to the Romans who fled thither, with the sacred fire. This fact seems to limit the possible latest date of the *terra cotta* to some 2,260 years ago, as there is no evidence of any Roman influence in the art displayed. The possible anterior limit it is more hard to assign. The letters are of a type which it is difficult to know whether to attribute to the Phœnician or to the early Greek alphabet, the *mu* and the *theta* holding most closely to the latter, and the *pi* to the former. They are boldly laid on in a sort of black paint. The inscriptions have been read by Mr. Murray, a gentleman whose appreciative knowledge of Greek art is an honour to the British Museum, as follows:—(1) *Mi vela vesnas me vepe tursi kipa*, and (2) *Thania Velai Matinai Unata*. The presence of two forms of the *S*, Mr. Murray remarks, shows the presence, in the dialect employed, of the Phœnician element of a double sibilant. The ethnological peculiarity, however, strikes us as likely, when explained, to be more determinative of date than the forms of letters, which certainly have a very wide range, both geographically and chronologically. Some special local peculiarity, such as the presence of a Greek slave, accustomed to the work of the studio, in Cære, may possibly have been the cause of the anomalous representation of types to which we refer. But even if such an artist had used portraiture for the principal figures, and added the remainder of the groups in a conventional style, it is hard to understand why he should have represented his own countrymen in the inferior position.

A mixture of nude and draped figures in the same composition is to be found in many Indian sculptures, of the same date and character as that elaborate gateway of the Sanchi Tope which was exhibited two years ago at South Kensington. In these we are perhaps justified in regarding the former as representing gods, or happy souls, and the latter the living mortals of the country. If this be so, the absence of drapery in the figures we term Phœnician may possibly have a similar import. But, in any case, the definite portraiture, which is unmistakable in the figures in the round, marks clearly to which of the two types the monument properly belonged.

Closely connected with this fact is the very small size of the sarcophagus; the occupant of which must have been less than 5 ft. high, if, as there is every reason to conclude, the body was laid straight in the receptacle hollowed out as if for the purpose. It is suggested that the remains were those of a female, and even that they were, according to the inscription, those of Tannia Unatia, the daughter of Velius Matinius. This might account for the small size; but on the other hand the gaunt nude figure reclining on the mattress and cushion forming the lid of the sarcophagus, seems to be naturally regarded as the person in whose honour it was modelled. We are far from despairing of the solution of the riddle, but at present it is one of great perplexity. Nor is the fact that the two descriptions, which have appeared in two of the best-informed of our contemporaries, are altogether silent as to the peculiar significance of the physiognomical characters of the work, calculated to direct that attention to the subject which it unquestionably deserves.

Not directly connected with the Castellani sarcophagus, but belonging to the same category of ancient and recently-discovered terra-cotta figures, are to be named the objects lately found at Moab, and collected by Mr. Shapira, of Jerusalem, which have been purchased by the Emperor of Germany for 1,000*l*. A rather acrimonious controversy has raged about these objects, in which we scarcely think that the experts of this country have shown themselves so much alive to the real interests of art as have those of Germany. Imputations of forgery have been very freely cast upon those who are not in a position readily to defend themselves. There is no doubt that the manufacture of mock antiques is a branch of rascal industry that is not confined to Flint Jack and his pupils in this country, or to the dealers in earthen lamps, and bronze symbols of a well-known character, in Southern Italy. How beautifully the antique spoils that have been rusted by the tufa of Pompeii, or preserved in the air-tight embrace of the lava of Herculaneum for 1,800 years, may be simulated, let those who take an interest in that graceful branch of art judge for themselves by a visit to Mr. Gardner's showrooms at Charing-cross. There will be found many an object stamped with the *cachet* of the Italo-Greek work of the First Christian Century, of which it has all but the actual verity. But in all these matters, whether they are arrow-heads, phallic charms fabricated for the purpose of deceptive sale, or classic objects simulated for the elegant adornment of our drawing-rooms, there is to be remarked the constant presence of one characteristic. They all hold to that which is known, and generally to that which is well known. The forger is, *eo nomine*, a copyist. He is never an inventor. He would, in that case, indeed, be an original artist. We all know the story of Michelangelo and his Cupid. How he wrought the statue, and then broke off and buried the arm; and how, when the earth, perhaps with some aid from sulphuric acid, had given a false air of antiquity to the

fragment, he produced it, sold it as an antique, and afterwards—as in the *sic vos non vobis* of Virgil—produced the arm. The very Cupid, some experts tell us, is now to be seen in the Court of the South Kensington Museum. But Michelangelo was a sculptor of the rarest powers. He studied the antique till he was thoroughly imbued with its spirit. He thus produced a work in which that spirit breathed, and by means of which, with the aid of artifice, deception was easy. And even then, when the whole figure is examined, a sculptor would never hesitate as to whether it came from the chisel of the great Florentine, or from that of a Greek artist. Thus, the experience that we have as to plastic forgeries leads to the conclusion that quaint, grim forms, new to our eyes, such as those which have been brought to light in Moab, are the last things on which a forger would venture. The genius of the man who could now originate figures, at once totally dissimilar to any known type, coarse, rude, and often repulsive in appearance, but imbued with the very spirit either of astrological or of phallic worship, would be of a very high order. No such genius would stoop to such barbaric poverty of execution, combined with such depths of a religious sentiment, once predominant in the race, but now abhorrent to the ideas of the age, as marks the objects purchased for the Berlin Museum.

Without attempting, with the deductive analysis of Comte, to trace back the religion of the earlier tribes of man, first to astrolatry, and ultimately to pure fetichism, it is indubitable that, in very early times, and over a great range of peoples and of districts, two grand elements marked the religious thought of the time, and were constantly reproduced in symbol, and commemorated in worship. How deep a truth, in those rude, wild times, underlay the primary idea of those archaic objects of reverence, we do not now know. Perhaps we may never know. But the two main ideas, in themselves, were these: first, that of the constant, ever-present, irresistible power of the unseen Ruler of the world, evinced, sometimes, in the destructive energy, as in Typhon, but more generally in the reproductive, of which Indian mythology gives the most literal version; and, second, of the divine wisdom, order, and rule, of which the chief symbols and exponents were the planets. The extreme antiquity of planetary worship becomes more apparent with every fresh message from the long-forgotten past. The antiquity of the week is very great, and wherever the week is observed we have the evidence of study of the stars. The names now given to the days of the week, which connect them with the planets, are first mentioned, if we are not in error, by Dion Cassius; but there is good reason for supposing the connexion to be as ancient as that special division of time itself. It is common to trace the establishment of the week back to the Exodus, and to regard it as an institution of the Law of Moses. But, to say nothing of the very first chapter of the Book of Genesis, we find the week referred to as a well-established measure of time in the days of Jacob, 486 years before the Exodus. Again, the seven lamps of the golden candlestick are said by Josephus to refer to the seven planets, and he even mentions the *decani*, or ten divisions of each,—a matter which is purely astrological. In the same passage this author connects the fourfold structure of the veils of the temple with the four elements, and the twelve jewels of the ephod with the twelve months, or signs of the zodiac.

The septenary division, not only of time, but of general philosophical system, appears to have a direct reference of astrological considerations. The order in which the days of the week, consecrated to the several planets, follow one another, is far from being arbitrary or casual. It betokens acquaintance with astronomical phenomena, and an attempt to reduce these phenomena to system. It is not inconsistent with, although not a direct evidence of the knowledge of, the Pythagorean system. Archimedes, 250 years before our era, considered the position of the sun to be intermediate between the inferior and superior planets, the earth not being counted amongst either. Scaliger gives a complicated series of triangles, by the intersection of which the planetary sequence of the week is arrived at. But that idea of the seven-branched candlestick, which places the sun as the central lamp, and the three superior and three inferior planets, in the respective orders of their apparent velocity of motion, on the left and on the right, gives the exact sequence of the week, if we take the lamps in alternate order. Thus the sun is first kindled, then the moon, or nearest lamp on the right; then Pyrolis, or Mars, the nearest on the left; then Stilbon, or Mercury, the second on the right; then Phaethon, or Jupiter, the second on the left; lastly, Hespera, or Venus, the third on the right; and Phainon, or Saturn, the last on the left. Regarded in this simple order, we find the sequence of the week thoroughly to harmonise with formal, though not with physical, astronomy.

When we observe that not only the days of the week, but the series of years, and of weeks of years, are divided by the radix of seven, at the same time that the seventh day is specially consecrated by the religion that adopts this division of time, a close connexion with astrological, or at least with astronomical, law becomes apparent. The gravity of the character invariably assigned to the slowly revolving orb of Saturn, the tint of black which is assigned to it in the scale of colours, the connexion between the genius or deity of the planet, and the impersonation of Chronos, or Time, the father of Zeus Pater himself,—are in remarkable accordance with the expression "Antiquus dierum," which we find applied to the deity in that one of the Hebrew sacred books which contains the most direct reference to the doctrine of numbers.

A close relationship between the early religion of the Jewish people and the planetary worship is again to be traced in the account given of the incantations of Balaam. The erection, three times over, on the summit of as many mountains, of seven altars, and the double offering made upon each, is a distinct instance of planetary worship. We might therefore rationally expect, if we recovered any trace of the early idol worship of Moab, to be able to recognise some sign of planetary powers. This expectation is fully satisfied by the terra-cotta figures collected, and yet in course of discovery. In some of them may be recognised symbols of Astarte, Ishtar, or the moon; in others of the sun; in very many seven stars or seven punctures, or an accentuation of seven features or points upon the human figure, are notable. One, a female deity, has the sun in place of one arm, and the moon in that of the other.

It is as to the inscriptions, however, that the most uncompromising controversy has raged. These may be divided into three categories. First there are the Hamath inscriptions, originally questioned as to their authenticity, which is now admitted, but still in doubt as to their ideographic or phonetic character. Mr. Dunbar Heath has detected in these ancient sculptures marks closely resembling the cartouches of certain Egyptian kings; and his patient comparison, leading to the identification of certain symbols in different inscriptions or portions of an inscription, must be held to be the first step towards the decypherment of a hieroglyphic character totally distinct from the hieroglyphics of Egypt. Hamath, we need hardly add, is to the immediate north of Palestine.

A second group of sculptured characters occurs on certain slabs and lintels in Moab. They are less complex than the Hamath inscriptions, to which they do not present any sensible resemblance. But they mainly consist of rude representations of the idols formed in *terra cotta*; and probably will be found to be dedicatory or prophylactic inscriptions invoking the protection of the planetary powers for the buildings of which they formed a portion, or for their builders or owners.

The third group of characters consists of those ancient, but not unknown, forms which seem to have been the common ancestors of the Hebrew, Phœnician, Greek, and modern European alphabets. They are found painted on the foundation-course of the Great Temple peribolus at Jerusalem, incised in various ruins throughout Palestine, carved on the unfortunate Moabite stone, and impressed on numerous vases of burnt clay. It is as to the authenticity of the latter that the chief opposition has been raised; the ground of disbelief being stated to be the different antiquity of the forms of letters found upon the same object. We are not about to step from our chair to become advocates on either side. But we may remark that it is hardly conceivable that any forgers should have taken the trouble to cover rude jars, before baking, with very numerous impressed letters, the number of which must increase both the labour of execution and the risk of detection, while the selling value of the object itself is quite incommensurate with such an amount of misdirected skill. Again, in one of these inscriptions which has been condemned, as we think, over hastily, by one of our most learned authorities, who divided the letters into four categories, of different dates, we ourselves observed that certain characters which even the magnifying-glass could not aid us to discriminate from one another, were referred to different categories. While caution should be used, it is evident that the method adopted by the Germans, of first acquiring objects which are *primâ facie* of such great interest, and then patiently setting to work to describe and decipher them, is far preferable to our own cheaper method of encouraging discovery by simply denouncing it as forgery.

We have been led to dwell too long on the *terra-cotta* objects recently discovered in Etruria and in Syria to speak of the noble and unrivalled bronzes which Signor Castellani has been the means of enabling our national museum to acquire. As to the high character both of the skill of the founder and the art of the sculptor that these objects display, we may find another opportunity of bearing witness.

NOTES IN THE INTERNATIONAL EXHIBITION.

PICTURES, DRAWINGS, &c.

WE have already commented on the collection which makes the chief pictorial attraction of this year's Exhibition,—the works of Phillip and Creswick. Among the other paintings by British artists there is not much to call for special remark, a large proportion being of very mediocre merit, and some of the best too well known, or too recently exhibited, to bear fresh criticism. Among the exceptions may be mentioned E. W. Cooke's "Catalan Bay, Gibraltar" (743), certainly one of the best and most telling works of a painter who has of late years fallen a little too much into the groove of common-place realism. Poynter's spirited Roman military subject, "The Catapult" (758 *a*), is a good specimen of his treatment of figures in energetic action; and Pettie's "Conspirators" (332) is one of the very best illustrations of the peculiar powers of this very unequal artist. "When Leaves fall and Cold Winds come" (947), by G. Mawley, should be looked at as a beautiful unpretending work, full of the true poetry of landscape; and, in a contrary view, Storey's "The Children at Breakfast" (957), four little things perched like sparrows on a very high bench, painted with a genuine feeling and sympathy for child-nature. The same painter's "The Danaides" (1,010), is a fine study of semi-nude figures, very carefully drawn and painted in the slightly conventional tone which this artist adopted in his nude studies (a class of subject which he seems entirely to have discontinued of late); the sombre tone of the landscape of "Hades" harmonises completely with the expression and feeling of the figures, but it must be admitted that the work scarcely rises to the imaginative height which such a subject demands. Lucas's "Autumn" (1,017), not without power, is overdone, to the extent of becoming "stagey." Of that interesting class of small landscapes, notable chiefly for their feeling and composition, two by J. R. Lee (997 and 1,003), one by Cotman (1,092), and one by J. A. Houston (1,062), are very pleasant specimens. G. F. Watts's "Galahad" is not one of his best works; the head and bust by him, under the title of "Pygmalion's Wife" (1,026), is splendidly painted in regard to the texture and reflected lights on the neck and bosom. "An Afterglow" (1,077), by J. C. Thom, is a small picture, with much of feeling and poetry of light and composition. A representation of "Dr. Guthrie Fishing in Lock Lee" (1,097), by Sir G. Harvey, P.R.S.A., is a melancholy specimen indeed of the kind of rubbish which appears to pass for "art" with our canny cousins across the Border.

What is good in the water-colour room (there is a good deal that is not) is mostly by well-known hands, in their usual manner. We may remark how uniformly interesting and powerful are Mdme. Bodichon's broad, freely-handled sketches, rather than drawings, of landscape and sea. One work which must not be passed over, however, is the study, or series of studies, by the late H. Tidey, for a drawing of Pygmalion and the Statue (486–7–8). The large-size study (in pencil) represents the vivified statue doubtfully putting forward one delicate foot over the edge of the pedestal, feeling her way the enraptured sculptor standing by with hands

clasped over his head; from the two smaller coloured studies it appears that the artist aimed at representing the very moment when the first flush of life had begun to overspread the cold marble, and had scarcely reached the extremities of the limbs, or of the long flowing hair, which is just turning from snow to gold. The subject was one exactly suited to Mr. Tidey's peculiar powers of execution, and had he lived to complete it, he would probably have equalled or surpassed his famous drawing of "Queen Mab." While alluding to the water-colours, attention may be drawn to Mr. MacCallum's Sketches in Egypt (1,515–39), to be found in Room XVIII., and which are of much interest.

In Room IX. are placed some works by deceased British artists, including six of the beautiful little works of the late G. Mason. The "Harvest Home" will be remembered in last year's Academy; but the exquisite little picture called "Evening, Matlock" (765), has not been so recently popularised; nothing could be more characteristic of the painter's peculiar genius, few things more subtle and delicate in tone, than this simple composition, with the girl and sheep coming down from the upper portion of a rising field into the brown twilight shadow of the low foreground. A number of works by the late Mrs. Carpenter may be passed over in discreet silence; but some of those of the late A. Rankley (most popularly known by his rather tame picture of "Dr. Watts and his Little Friends") surprise us by a degree of power of tone and feeling which would seem to warrant a higher place for this artist's name than we are accustomed to hear given to it. "The Doctor's coming," the interior of a Gipsy tent, where a mother sits, in a wild paroxysm of grief, at the head of her child; "The Gipsy Mother," a single figure; and "After Work," are all pictures decidedly rising above the common-place or mediocre in art. The manipulation is scarcely equal to the composition, perhaps, as far at least as variety of texture is concerned; they are pictures on the old *chiaroscuro* ideal; but there is no lack of power.

Now as to the foreign pictures. There are a few interspersed among the English works, of which one by Legat (France) "A Recollection of the Mill of Gravelle" (320) should be noticed; it is a fine twilight composition of massed trees, with the old grey straggling building seen through them. The Meissoniers, too, which were recently at Bethnal Green, are exhibited here on separate screens; an honour of which they are well worthy, and which, indeed, works of such delicacy of detail almost require. Among the Belgian paintings in Room XX., but a small proportion can be quoted as of any marked merit. The "Undine" of Van Lérius (1,635), whose "Godiva" has popularised him in England, will hardly add to his reputation; the execution is not up to the mark of "Godiva"; the poetic element is utterly wanting. His "Elaine" (1,683) is inferior even to this; a total failure as to conception and feeling. "The Studio," by Sacré (1,630), showing an artist and his friend discussing some very every-day matter amid a conclave of bronze and marble deities, is a clever idea, of which, however, more might have been made. Of the two or three other figure subjects that are at all worth notice in this room, are Bource's "Waiting the Arrival — Beach at Schevening" (1,744), noteworthy for the thought bestowed on the composition and relation of the groups of figues; and "Dancing the Bolero" (1,765), by Dillens, which is clever, especially in composition and lighting, but otherwise not nearly equal to some of Phillips's Spanish pictures. Among landscapes, Roffiaen's "Village of Meyringen and Wetterhorn" (1,646), sustains his reputation as a powerful and studious painter of mountain scenery; Asselberg's two little views in "The Campine," "Morning" and "Evening" (1,654-5), are most interesting studies of nearly the same scene under different aspects of light; and Heymans's "Meadow in the Campine" (1,690), and Cooseman's "Interior of a Wood" (1,720), are works remarkable for tone and feeling, and a total absence of "paintiness"; the latter especially, a small study of dark ragged woodland scenery, painted very solidly, somewhat after the manner of Dupré. The "Scheldt near Antwerp," again (1,721), shows what Heymans can make out of grey water and two boats. There are other small landscapes worth attention (1,660, 1,747, 1,768), and Bossuet's architectural pictures, as masterly as ever, should be looked at, especially the "Moorish Tower on the Tagus" (1,670), one of the best things he has ever done of the kind.

The most characteristic productions of foreign art, however (mostly in a small way), will be found in Room VI., dedicated to "Bavaria, Italy, Germany, Saxony, and Holland." The Bavarian paintings have a general commonplace tone which renders them as a mass uninteresting, in spite of an average of good execution. Cohen's "Villa d'Este, Tivoli" (30), is a fine combination of trees and architecture; and Meermann's "Regensburg" (88), an old "schloss" and moat in deep shadow, with masses of brown trees relieved against a faint evening sky, is a work full of poetry. Marc's "Decameron" (46) will have admirers, melodramatic though it be; and Franck's "Wine-house in South Tyrol" (89), as a study in the opposite direction, the realistic of low life,—of a "boozy" Auerbach's tavern existence, — is clever and pointed enough. Among landscapes, Weber's "Twilight" and Heffner's "Close of Autumn" (73 and 78) are good specimens of imaginative treatment of common themes; the former reminding us of Lamorinière, whose works, always thoughtful and refined, we miss from this year's exhibition. Langko's two views near Munich (94, 95), and Professor Lange's "Lake of Lowerz" (98), are all landscapes above the average in feeling and execution: the latter with red sunlit cliffs standing over a dark lake, though a little "painty," is undeniably powerful. The small collection of Italian pictures is of some interest, if only from the peculiar idiosyncracies of style and treatment displayed. The little pictures of Professor Fattori, of Florence, are very original in motive and treatment: "Evening" (121), cows and thin bare trees on a dark plain; "Repose" (125), a woodland glade, with black swine and the swineherd in various attitudes of somnolence; "Landscape" (129), with two or three cows slowly making their way through long green grass under the shade of trees. These and one or two others, with a manner of treatment which borders on the humorous, have nevertheless real merit and originality of style, and show that the Professor has his own way of looking at things. Molinari's "Sappho" is a mistake; but in his pictures of the life of the Campagna,—"Leaving School" and "The Punishment" (147, 156),—he is thoroughly original, reminding us a little in manner of some of the Dutch school in paintings of low life; his tumble-down misshapen lumps of buildings are most characteristic. Ciardi's "In the Fields" and "Returning from the Fields" (143, 157); Ciardello's "Confidantes" (163); De Tivoli's "Ruins of the Claudian Aqueducts," standing up red in the sunlight in the foreground (155), are all works interesting in their way, and with a nationality of manner and tendency sufficiently distinguishing them from the works of any other nation represented here.

The small number of paintings (chiefly from Dusseldorf) included under the very large and vague term, "Germany," contain two works worth a note, though for different reasons. The first is a special compliment to ourselves, being a portrait of "The English tourist" (121), in full travelling suit, portly and well-fed, standing in the midst of a Swiss mountain scene, conscientiously "doing" the mountains, *lorgnette* in one hand, and "Murray" in the other. This is sent over to us by the kind consideration of the artist (W. Simmler), that we may—

"See ourselves as others see us;"

but the species portrayed are, we fear, too thick-skinned to be reached in this mode. Let us ask, by the way, does no other soil grow the same kind of animal, or its equivalent? The other work referred to, "The Sea Shore" (189), is by E. Dücker, of Dusseldorf, whose grand landscape, "The Bed of a River," was the finest thing of the kind in last year's exhibition (where, by an odd mistake, it was classed with the Russian pictures). The tone of this work is peculiar, and the sea is of a perhaps scarcely admissible brown, but the painting of the shore and shoal water in the foreground is splendid, and the whole thing has that power and unity of feeling which only genius can impart to a painting. If this artist, little known in England, has attained in the average of his works anything like the elevation of these two, he is one of the finest landscape-painters living. "Saxony," which occupies the next place on the walls, introduces us to another very fine work," "Verona" (195), by Choulant, of Dresden: the view is taken from the river, the sluggish turbid water of which forms the foreground, crowded with a number of heavy black barges, above which rises a congeries of white low-roofed houses in all kinds of fantastic groupings, crowned by the tall Romanesque cathedral. This is one of the finest paintings of an architectural subject, on a large scale, that we have seen. "Saxony" presents nothing of note besides, and Holland is to be credited only for some very good small landscapes, of which the best are Van Beest's "Strand at Scherening" (222), Destrée's "Sunset in Gelderland" (230), Vogel's "Landscape" (217), and Liernur's "On the Sea Shore" (215): the last curiously reminding us, in feeling and manner, of the works of our talented countryman in the same "line," Mr. H. Moore. On the staircase adjoining this gallery is hung, among other things, a large painting, by Baron Gudin, of "Byron on the Brig of Don," near Aberdeen (a great deal of the "brig," and a very little of Byron, it will be understood), of which we will only say that we regret to see such a name to such a work. Some foreign artists seem to think that any "English" subject is sure to please the English, however handled. We have not all come to that yet, however.

A whim of this Exhibition has been the collection of drawings, sculpture, &c., by officers in the army and navy, in Room XVIII. There are very accomplished amateurs among the members of these professions, whose works might claim hanging-space anywhere; but taking the collection as a whole the result is not remarkable: even in cases where the execution is of a high class there seems to be in the main, as it struck us, a remarkable lack of feeling for artistic effect, the side on which the amateur generally may be supposed to have the best chance of success. Col. Crealock's sketches of celebrated cavalry charges are spirited enough in intention, but the horses' legs are wonderfully put on. The works in statuary by Lieut.-Col. F. Baring, however, are quite above the amateur average. The officers seem to succeed best, as a rule, in drawings of buildings, of which there are some also in the Albert Hall Gallery, of unquestionable excellence. Among the subsidiary attractions of the Exhibition are to be found, also in the Gallery, the collection of etchings, by some of our finest artists in that branch of execution. There is a whole collection of Mr. Whistler's, the peculiar excellencies of which are well known. The small etchings by Mr. Jesse (3,220) are very powerful, and recall in style and handling some of those executed by Blake as book-illustrations. Mr. E. George's etchings of architectural subjects on the Moselle (3,233) are good in another manner; and Percy's "At the Opera" (3,224), a half-length figure, shows what delicacy of texture and tint may be attained in this medium, more suited as it is in general for slighter work. The frame of five etchings by Messrs. Cope, Hook, O'Neil, Millais, and Slocombe (3,256), is most interesting; that of Mr. Slocombe, a master in this art, is admirable for its light and atmosphere, and should be compared with his "Illustrations to Sophocles and Ovid" (3,228). There are plenty of other specimens of the art that are worth looking at. The collection of engravings and photographs here will repay attention; among the latter are some of Mrs. Cameron's effective figures and groups from nature.

The show of sculpture this year is small in quantity, and includes a good deal that is not remarkable in quality. Torelli's "Young Masaccio" (2,033) is a finely-finished statuette in the usual modern Italian manner, with all the texture of the dress minutely and elaborately worked upon it. Fontana's two busts, called respectively "Coquetry" and "Summer" (1,914-15), are very elegant and finely modelled. In the latter the full, yet delicate, lips give a peculiar character quite in keeping with the ideal subject. The same sculptor's figure of the youthful "David" (1,913) strikes us as weak and nerveless. Another very charming head by Braga (the Italian sculptors seem to have a fancy for these ideal busts) is that called "Bashfulness" (1,878), a very sweet face, drooped a little forward, and with kerchief tied round under the chin. The most original work exhibited is certainly that by Mr. Lawlor, "The Itinerant" (1,969), perhaps suggested by Scott's wondering "glee-maiden" in the "Fair Maid of Perth": a young girl reclines on the ground, with a mandolin, one knee up, the face turned to one side, with an expression of weariness and dejection. The pose of the figure and the composition of the lines of limbs and drapery have been carefully studied, and it looks well from every point of view. The scale is about half life-size. The artist's other

work, "Artemisia," though delicately modelled, is not at all equal to this one. Among the Italian heads we may notice two more, Argenti's "Happy Memories" (1,861), as an antempt only partially successful, to realise a very momentary and fleeting expression of pleasure on the countenance; and Pessina's "Prayer" (2,006), a very beautiful up-turned face, with parted lips, quite realising the expression suggested by the subject. It is worth while to look at these Italian heads (of which there are a good many more), as specimens of ideal treatment in sculpture purely by the medium of facial expression. The execution of most of them is very finished, and both in execution and expression they belong to a higher walk in art than those leering, grinning busts which Carrier and others of the French school have unhappily affected. Among the specimens of child-sculpture, to which modern artists seem to have been a good deal led, are some very pretty works,—notably the one called "Innocence" (1,890), by Dal Negro, a figure of a little chubby maiden, who, "prodigal enough to unmask her beauty," is funnily quarrelling with her only garment, unconscious of any conventionalities. Braga's "La Vergognosa" (1,876), which might almost have been intended as a companion to the last-named, a coquettish little girl, with her head on one side, laughing slily, is scarcely so successful, as the sculptor has tried to seize an expression of face too pronounced, and at the same time too momentary, to be quite suited for marble. There are two little works in one of the adjoining galleries worth a word, because each embodies that unusual thing, an "idea." "The Orphan," by Paganucci, is a little boy's head and bust, the face thin and sad, looking down, with one hand on the cheek, and an expression of premature care. It is a very touching little work. In the same gallery a small statuette, in terra-cotta, by Dillens, of Brussels, gives an ideal representation of "Echo." A nymph, with long hair floating down her back, is standing, with mouth open, and a wearied expression, as if aimlessly and fruitlessly calling out about nothing. This is a very little figure, and might easily be passed over; but the artist has succeeded in embodying his fancy, which is an original one, and value in such cases does not go by size.

We have thus rapidly indicated what there is that is worthy of particular attention among the fine-art works of this year's International Exhibition, and hope that our remarks may both save our readers some trouble in hunting the best things through a mass of inferior ones, and insure attention to some small and out-of-the-way works which, nevertheless, do not deserve to be passed over. We take this opportunity, however, of again expressing an opinion that to attempt an exhibition of fine art on this scale every year is a mistake, which can do no good to art, nor to the public taste, nor (in the end) to the promoters of the Exhibition. No doubt, there is a certain proportion of works which we are glad to look at, but there is a much larger proportion which are of no good at all to any one, and would scarcely be hung in any other exhibition; and this state of things is likely to get worse instead of better. The first Exhibition was talked down upon by artists on account of the low average standard of the paintings, though we had in that year those clever contributions by Italy in sculpture and painting which surprised every one, and the splendid display by France of the leading names in her beautiful, if somewhat narrow, school of landscape art. The next year the average standard was lower; this year it is much lower still; and so it will go on, if the exhibition be made an annual affair; and we would seriously ask, what is to be gained by the mere process of lining a long wall every year with so many furlongs of pictures, good, bad, and indifferent? Let the picture-exhibition be made a *triennial* one, and duly notified as such on the Continent, and the leading artists of each school would have time to devote to something worth sending; and in such a case the exhibition might afford the most admirable opportunity for comparing the progress and the respective merits of different schools of modern painting.

Institute of Architects.—The royal medal and others will be presented at the closing meeting of the Institute, on Monday next, June 9th, and a paper by Dr. J. W. Hayward, "On Health and Comfort in House Building," will be read. The Institute *conversazione* will be held on the 3rd of July.

A LOOK THROUGH LOW LEYTON.

WITHIN the last month we have been to Low Layton, or Leyton as it is now termed, and we repeated the journey to assure ourselves on one or two matters. This somewhat scattered and straggling town, situated at a slight elevation above the river Lea, or Ley, from which it is supposed by some to take its name, is improving of late years in buildings, and, of course, in population. The ancient village, though it must have been small, yet appears to have been one of importance, and its history is, in a measure, mixed up with that of Leytonstone, Stratford, Walthamstow, and other adjoining districts. Whether Low Leyton has been the Durolitum of Antoninus is very doubtful, we think, though urns and other Roman remains have been unearthed here for a century back. The manor belonged once to the Abbey of Stratford, but at the dissolution it was given to Lord Chancellor Wriothesley. Since that period it has passed through numerous hands.

We must leave notice of its antiquities for some other occasion, desiring just now to speak of matters of more immediate interest.

The almshouses date back to 1658, and are the foundation of a worthy citizen of London, named John Smith. Built with red brick, and roofed with tiles, backed in their entire length against an arm of the churchyard, and one end of them abutting the body of that ground, they present, with their little gardens in front, a picturesque appearance. Appearances, however, in this case, are very deceptive; for, on closer examination of their interiors, each almshouse is but a single room, with only one window in front. There is an absence of ventilation and other healthful arrangements in these eight almshouses, so called, and nearly all the inmates of these eight small rooms, who are aged women, were ailing when we visited them. It can hardly be otherwise. The only "accommodation" for these eight houses is one small compartment situated in the centre of the row. The inmates of the rooms on either side of this closet suffer grievously from the smell arising. The trustees of the charity or the vestry are bound to remodel these almshouses, as a matter of decency, sanitary precaution, and improvement. The charity is a small one, and the benefits accruing to the poor aged and infirm inmates are small. The sum of 3s. 6d. per week, and a ton or less coal in the year, are not sufficient. From Advent to Easter a 4 lb. loaf is distributed to each inmate weekly. Formerly, we hear, it was given all the year round; but some years ago this benefit, we learn, was transferred to an adjoining district. A suspicion exists in the town that the full benefit of Smith's trust is not enjoyed by the present-day recipients of his charity; and it is represented that other donors, subsequent to Smith's death, left sums to be added to the charity. The subject is worthy of inquiry, that the truth may be stated, and suspicion set at rest; indeed, the whole subject of charitable trusts needs another Government Commission, for it is to be feared that many benefits have been filched from the poor from time to time.

In a sanitary direction and with minor improvements, the Local Board, or rather the vestry authorities of Low Leyton, have for the last two or three years been doing something; candidly speaking, we cannot say they have been quite successful in what they have attempted. The drainage of the town is imperfect, and of course defective; and the outfall sewer, anent which some hubbub was created several months since, is not at all what it should be in design or execution. Probably the local engineer's hands were tied, and it is not at all unlikely that his plans were in a measure frustrated, and himself badgered by the wise vestrymen, or a majority of the noisiest of them. If common report be correct, a great amount of talk takes place in the vestry-hall, and a very small amount of practical work. The outfall sewer and filtering-chambers are not ambitious pieces of sanitary engineering. We have come to this conclusion from an examination of them, and their surroundings, entrance, filtering-beds, and outfall. The entrance culverts to the filtering-chambers deposit of course their unmitigated cargo of sewage matter, yet after passing through several chambers with their netting, the final clearance chamber receives more than the effluent water that should pass out clear through the outfall culverts. Despite of netting and ballast the "blacks" turn up in large quantities, or in other words, floating patches of escaped and unprecipitated sewage escape through the outfall culverts. Where, think you, does the outfall empty itself? Into an open ditch,—another open foul sewer, once a running stream, but now a stinking oozy ditch. We have not traced it to its source to find where it receives its first foulness; but from the Low Leyton Outfall, where it receives an addition to its filth, we have followed the course of this ditch through the fields for a considerable distance. Well, then, the outfall water, which is not very clear, mingles with other foul water, meanders along through the low marsh lands of the Lea, towards Temple-mills and Stratford; but the current on its way intersects several other cross ditches, some of which carry a portion of the outfall drainage of Leyton into the river Lea.

If the Vestry Board of Low Leyton have not a high opinion of their own dignity and importance we do not know what other vestry has. They have commemorated their service to humanity by having an Aberdeen granite slab or tablet inserted in one of the brick piers of the gateway at the entrance of the outfall works. The names of the whole of the vestrymen, clerk, engineer, and all are epitaphed in sunk and gilt letters. The tablet lacks one adornment. A space should have been allowed at top for a death's-head and cross-bones. It would then be symbolical of their labours, and in a future age it might be utilised in the village church as a polygraphic memorial of the great departed.

Perhaps the members of the Board will grow wise in time. We do not wish to be too hard upon them, but if they would take an honest advice let them at once mend their ways,—roadways and pathways,—and perfect the drainage of the town, which is very defective. The class of houses at present erecting in the town are of the usual cheap speculative build, though a large portion of the land is freehold. Many of the houses of the poor are unsanitary within and without, and the accommodation is bad. The water supply is mostly from pumps; in the high parts it is good, but in the low it is unfit to drink. The town from its situation is liable to periodical attacks or outbreaks of zymotic disease. In the winter months the marsh lands below the town stretching each side of the river are covered with water, and from these rise and float thick mists sufficient to render a person at a few yards invisible. A *quasi* London fog, in fact, often and for long periods, envelops the marshes in the winter, and extends over Low Leyton. The old buildings and mansions of the gentry in the neighbourhood are good specimens of red brickwork in the style common in the reign of Anne, showing good moulded brick ornamentation on the front. Some years ago many persons of title and rich City merchants resided here, but the rapid extension of East London has driven them more inward to Essex, or altogether away, and the lands they occupied are now being intersected with new roads, and are being built upon. Low Leyton and neighbourhood contain at present many nursery gardens, in which flowers, plants, and shrubs are reared for Covent Garden wants; and if there be any trade indigenous to the district, nursery gardening would seem to be the only staple one. Some of these nursery gardens are well worthy of a visit, as a good deal of horticultural craft is displayed in their management. Near to the town, the well-known Mr. Barclay, of the banking firm in the City, has very fine gardens, but of course these are for private use, and the pleasure afforded. One of the urgent wants of the town is a ready mode of communication with the City. Either by Stratford or by the Lea Bridge-road, is a round-about journey, involving much loss of time. The so-called railway station at Leyton is at a distance outside the town. A new road is required across the marshes and the river, to commence alongside of Church Farm, and to take the direction of Hackney, or South Hackney; and a branch of railway from Hackney Wick could be continued to accommodate the town, passing on to Snaresbrook, and other unserved villages. The tramway line from Clapton could be continued along the Lea Bridge-road, to serve the town and other places, and a tram line from Stratford in the opposite direction, could meet it in the town.

These low marsh lands already alluded to on either side of the Lea, between Hackney and Leyton, are, we believe, in portions manor, commons, and common lands, and a difficulty would no doubt be experienced in securing any part of them for irrigation purposes. In view of the future of the drainage of Low Leyton and surrounding districts, these lands should be drained,

levelled up, and utilised at least to some extent by irrigation. The several open ditches that receive the outfall drainage of Leyton should be covered in, the river Lea saved from further pollution, and a proper system of main sewerage perfected for Low Leyton and surrounding districts.

PUBLIC WORKS IN EGYPT: CAIRO.

An official report, just published, upon the public works of Egypt, with more particular reference to Cairo, gives some interesting information relative to this subject. The present Viceroy of Egypt has done more, it is stated, for the improvement of his capital during the past four years than was ever done before in so short a space of time; and the many admirable public works which he has carried out are spoken of with the greatest admiration. Gas has been laid down in all the principal streets of Cairo, and they are now better lighted than are those of many of the capitals of Europe. Water-pipes have also been laid down in all the principal thoroughfares, from which a plentiful supply of good water is distributed to all the houses whose owners desire it, and are prepared to comply with the necessary regulations. New streets, of considerable width, have been opened through the most densely-crowded quarters, where formerly the alleys were so narrow that the projecting lattice-windows from opposite sides nearly touched each other, and where, owing to the want of ventilation, an epidemic which once occurred was not eradicated until the population was decimated. A large open space, called the Ezbekiah, situated in a fashionable part of the city, was formerly traversed by a seething ditch, and disfigured by mounds of rubbish and small Greek and native drinking-booths. This space has been lately enclosed with iron railings, the heaps have been cleared away, the ditch is filled in, and a pretty artificial lake formed, which is regularly supplied with fresh water from the Nile. The remainder of the enclosure is tastefully laid out with gravel walks, flower-beds, &c., and there are also in the grounds kiosks for bands of musicians, for theatrical representations, and entertainments of a similar order. The land outside this enclosure is being built upon, in accordance with a uniform plan, arcades and shops forming the basement of handsome houses. A tract of land, between the Ezbekiah and Boulac, has been laid out in carriage-drives, and the land has been given by the Viceroy to any applicant who would undertake, within a given term, to erect on it buildings on an approved plan. The German colony has just completed and inaugurated a Protestant church; and a piece of land has been granted to the English colony, in order that they may erect an Anglican church. An opera-house for Italian operas and ballets, a theatre for French plays, and a hippodrome for horse exercise and acrobatic feats have also been built at the expense of the Viceroy. The singers, actors, and performers required for these several establishments are engaged in England, France, and Italy, and during the winter season high salaries are given. Another work of considerable importance has been the construction of a carriage-road to the Pyramids, and another to Heliopolis. All these new roads and streets are bordered by neatly-planted trees, chiefly acacias and sycamores, and an agreeable boulevard appearance is thus imparted to them. The construction of railways is also a work not by any means neglected in Egypt; in fact, altogether there are at present about 750 miles of railroad working in the country. Shortly after the completion of the Suez Canal, the Egyptian Government caused a line to be laid down from Benha to Suez, *vid* Zagazig and Ismailia, thus running parallel with the new canal, from which the engines and passengers were supplied, and the expense of sending water-trains consequently saved. The rails of the old lines through the desert have since been taken up and utilised. On the left bank of the Nile, there is a railroad from Cairo and Rhoda. The northern terminus is at Einbuba, a place directly opposite Boulac, a suburb of Cairo; and trains are taken across the Nile on a railway ferry. This ferry, however, is only available during a portion of the year, owing to the rise and fall of the waters of the Nile. A large iron bridge has lately been erected over the Nile. On the right bank it is situated near to the palace called Kasr-ed-Dubbara, and on the left bank it lands at Gezirah, a small district which was formerly an island, but which was lately joined to the mainland by the artificial filling up of the left branch of the Nile. It has subsequently been found that the water of the two branches, by being diverted into one bed, has caused damage to the banks, quays, and to some houses, amongst which is the Boulac Museum. It has, therefore, been decided to re-open the former stream. Another bridge has been constructed on dry land at a convenient spot to connect the future island with the mainland again; and a canal will be dug and made to pass under this new bridge. A carriage-road connects these two bridges, which road leads from Cairo to the pyramids, in an almost direct line. It is significant to notice, also, that the Viceroy possesses a well-conducted printing establishment at Boulac, for Arabic works. Many valuable publications have issued from this press. His Highness has also built a large paper-mill in close vicinity to this establishment, at a cost of about 80,000*l*.

ALESSANDRO MANZONI.

All Italy is in mourning. One of her greatest has gone to his rest. Manzoni, whose mind assimilated more than other writers' to that of his great predecessor, three centuries back, the immortal Dante;—Manzoni, the loved and venerated by all his countrymen, has after a long life of patient waiting for his country's freedom, a long life of domestic cares and losses, in which he has survived all dear to him, lived to see the unity of Italia, an event that seemed to him ever as a poetic dream, and at the advanced age of eighty-nine gone to his grave.

Born in Milan, 1784, he owed his first education to his mother, the daughter of the illustrious Beccaria. His life is learned in his writings. The man to whom Italy owes so much, for his pure, elevating teaching through his works, whose name will be written in golden letters among the regenerators of his country, remained through his long life far from public cares, taking no active part in the struggles that occurred; he was not among the imprisoned or exiled when his Lombard compatriots were persecuted, not because of any servile submission to the stronger, but because his own greatness stood so conspicuous that he could not be attacked without offending the whole civilised world. He remained in his native city, Milan, during the five days' struggle, hoping always to see the flag of independence float over his beloved city. A pure, religious spirit guided him through all. He wrote not much, but the little he wrote was of the best, the most instructive and enlightening.

His "Promessi Sposi," read in every land, in every tongue, is his best known work. His poems and sacred hymns are known to all Italy. His life of Frederick Borromeo is celebrated. His love for the French nation was very great, and among his writings will be found many valuable works on the history of the French. His retiring modesty equalled his genius. His loving religious spirit shines forth in his great character of Don Cristoforo, in his great romance.

His fervent love for his country, and his own deeply religious mind, made him always cling to the belief in the existence of the same in his countrymen.

After the publication of his great novel, he ceased writing romances, and even disapproved of that kind of literary work. It may be remarked how few good romance-writers have existed or exist in Italy. Our social habits may require the aid of romances, while those of Italy's more favoured inhabitants, by clime and nature, are supplied by the evident romance of everyday life.

Manzoni's works are read and prized by every Italian who can read. His death occurred on May 23rd. His last prayer was for his king and country.

Telegraphic despatches announcing his death were immediately sent to the King, the Royal Princes, and the Parliament.

The body of Manzoni, which had been embalmed, was interred on the 29th of May, with great honours. His death, though long expected, has produced a general regret. All seek to do honour to his memory.

New Town-hall at Wrexham.—Sir Watkin Williams Wynn, M.P., has opened a new public hall and corn-exchange at Wrexham, including club-rooms, a magnificent concert-room, and every convenience.

CRUSHER FOR CONCRETE, CEMENT, AND ASPHALTE.

The introduction of machinery as a substitute for manual labour has been for generations past a sore subject with many of those more immediately interested. That the supercession of the one by the other has caused disturbance in the channels of industry,—that it has caused distress in some instances, in many, it may be,—is not to be disputed. On the other hand, however, it would be easy to show that the use of machinery has, in many cases, greatly reduced the prices of divers necessaries and luxuries, has conduced to the welfare of the great body of the people, has originated new industries, and has opened up and made available mines of wealth and sources of advantage that would have remained closed but for its use. Many machines, indeed, do their beneficent work without the displacement of any manual labour at all, but have caused rather its creation; as, for instance, the steam road-roller, a comparatively recent innovation, that produces a result greatly desired, it may be, before its introduction, but a result scarcely dreamt of or attempted to be produced as within the power of men and horses. Stone-crushing machines for the production of "road metal" may be objected to by "Luddites," if any survive, but these machines have really performed the feat of giving good roads to countries and districts in which the roads were, before their introduction, impracticable for most of the ordinary purposes of commercial and civilised life.

Any one visiting the Montpellier Iron Works, Walworth, will find that the machines produced by Messrs. J. C. Cole & Co. are capable of doing a great deal more than breaking blocks of granite into small cubes to be used as road metal. A large machine just completed is to be sent to Berlin for employment on the streets in grinding to powder the Neufchatel asphalte with which they are paved. It has been ascertained that the asphalte loses much of its virtue in the course of transit, when it is ground in the quarry, and in Berlin it is to be delivered in blocks, and ground down by one of these machines stationed in or near the street in which the material is to be used. The machine occupies a very small space; it is 8 ft. long by 5 ft. wide, and 6 ft. high, and may be driven by either steam or horse power. The disintegrating parts of the machine, which are strong and simple, are different from the arrangements in any other machine employed for stone-crushing. They consist of strong metal teeth of pyramidal form, the bases of the pyramids being fixed upon two parallel shafts, and the teeth working into each other. From the crushing-machine the stuff passes by a sloping shoot with a jigging motion to the grinding metal discs, beneath which it is reduced to powder. In the crushing machine the asphalte is liable to clog, and scrapers are introduced to prevent this effect. Between the grinding discs, curious though it may seem, this tendency to clog does not appear, and the asphalte is driven out rapidly at the edges, cool, and in the condition of a fine powder. The machine reduces twenty-five tons of bituminous rock asphalte to powder in a day of ten hours. It weighs about six tons.

Another interesting machine has just been completed in the same works, that differs in construction, and is destined for quite a different use, from the asphalte-crusher. This is a double-action stone-breaker, for the production of material for making concrete and cement, and reduces granite, limestone, quartz, or any other mineral, to pieces of a quarter of an inch irregular cube, or any other desired size. It has two hoppers and crushing-chambers, one on each side of the cross central shaft, which has a heavy balance-wheel at each end, and is driven by a belt. On the outer sides of the two crushing-chambers there are toothed surfaces of chilled iron, that are acted upon by the two toothed moving surfaces attached to the main shaft. The attachment of a cam to the shaft gives an effective eccentric action to the crushing surfaces, that may be best described as a "chewing" motion; being a combination of forces applied vertically and horizontally. The shaft makes from 200 to 220 revolutions per minute, and, as each jaw does duty at every revolution, it follows that crushing-force is exercised in the two chambers from 400 to 440 times per minute. It was interesting to notice, as evidence of the strength and simplicity of the machine, the condition of a piece of wrought iron that had accidentally got into it while at work. The iron is deeply marked with the teeth of the grinding-faces, but could not get through

the narrow egress at the bottom of the crushing-chamber, and the effect was simply that it stopped the machine, and caused the belt to slip, until the power could be turned off, and the innovating substance removed.

ON CHURCH RESTORATION.

ARCHITECTURAL ASSOCIATION.

AT the last meeting, held on May 30th, Mr. W. White, F.S.A., read a paper on "The Restoration of Adisham Church, Kent." The village is about six miles east of Canterbury, on the road to Dover. The church is cruciform on plan, with a central tower, and an Early English chancel of considerable size and excellence. Mr. White traced the history, and detailed the features of the church, and the fresh light gained in the course of the recent restoration under his superintendence. He called attention to the position selected for the pulpit (on the west side of the south-east pier of the crossing). The popular notion that the north side (the gospel side) is the proper traditional place for the pulpit, Mr. White disputed, urging that the sermon is another matter, and that old pulpits, undoubtedly *in situ*, as in Devon and elsewhere, are on the south side. A comparatively modern upper story has been removed from the tower, and a steep pyramidal roof constructed, covered with deal shingles Burnettised. This covering does not cause such hazard to roofs, in case of a slip, as would plain tiles (used in the other new roofs); and the colour is now very pleasing, calling to mind the old shingled roofs of churches on the Rhine. A late Mediæval segmental pointed arch under the pointed east tower arch has been removed; and its work in keeping the piers in their places is now performed by an old screen and large oak straining pieces, resulting in an improvement in the view of the chancel, heretofore disfigured by the arch inserted for stability without regard to beauty. The large tower piers make the arches comparatively small (12 ft. 3 in. in the clear). The inconvenience from this has been in part overcome by seating the nave (which has no aisles), with fairly wide spaces next the side walls. An old stone bench table round the side walls remaining in a considerable portion of the nave, is exposed by this arrangement, which was, however, mainly followed in order to keep the seats, as much as might be, in the space opposite to the tower arches (the central passage in the nave has not been omitted). The ground on which the church stands falls rapidly towards the east end, and the chancel floor was below that of the nave, no doubt so arranged from motives of convenience and economy. After convincing himself that this was original, and that the proportions of the church would suffer by alteration, Mr. White succeeded in obtaining the retention of the step down eastward, raising, however, the extreme east end by steps. He expressed an opinion that frequently old churches have suffered greatly in general effect by the diminution of height in their chancels in the raising of the floor in a way not contemplated in the original design. The position of the good-sized organ on the side of the chancel (not in a recess) was found to carry the organist's seat nearly to the centre line. This difficulty was got over by placing the organist at the opposite side, and the organ is played by trackers under the floor, with advantage in use, as he can hear the choir without being disturbed by near sound of the instrument. In making some general remarks on the subject of church restoration, Mr. White advised under rather than over restoration—the maintenance of ancient features not absolutely injurious to the uses of a building, even though not of special beauty in themselves. At the cost of much personal trouble the old timber porch on the north of the nave was got together again, and forms an interesting feature, though considered quite hopeless by the workmen. Well-intentioned people, anxious to make neat work, require to be carefully looked after: some early fourteenth-century caps, gray with age, not perfectly true in form, would have been reworked, and made geometrically accurate but for imperative orders. Decayed work should not be restored, as its authenticity is rendered doubtful. Much of the motive for the preservation of such work will be gone if confidence is taken away in its being what it was at first For determining the date which should be followed for new work, such as new roofs, &c., no universally applicable rules can be laid down. The character of the parts of the building to which they will be put must regulate the treatment in each special case. In this restoration the chancel roof follows the character of the Early English architecture below. In all cases the general effect, the attainment of a religious and solemn character with real harmony in design, should be the great consideration; and with this the following out of any mechanical rule of mere conformity of style to that of certain old features might be in conflict.

OPENING OF A NEW STATION ON THE SOUTH-EASTERN LINE.

ON Sunday, 1st June, or more correctly, on Monday last, a new suburban station was opened for public service, that is situated about midway between New Cross and Lewisham Junction stations of the South-Eastern system. The new station has nothing pretentious about it in an architectural point of view. It is formed in a deep, wide hollow, and has three double platforms, each long enough for the heaviest passenger trains, and that accommodate seven lines of rails, two of which are, however, for shunting and engine-turning purposes. The platforms are covered, for about half their length, with very neat and substantial timber roofs, covered, in flat section, with galvanised iron, corrugated. Access to the platforms is by a bridge and three stairs (all covered), that are, by a happy thought, legibly numbered 1, 2, and 3 at the top of each. The booking-office and waiting-rooms are on a level, considerably higher than the platforms, and rather lower than the public road. The structure is of timber, but well finished within. It, as also the roadway leading to it, is on "made ground," with which concrete, judiciously applied, is combined. The new station accommodates ninety trains up and down, per day. The number of trains up and down that pass the station are about 200 per day. It is expected that this station will prove a great convenience to the residents, and a great saving to the company, by enabling them to run "shuttle" trains, and saving the carriage of an enormous proportion of dead weight.

FRIENDLY RECOGNITION.

MR. WYATT PAPWORTH, who has given valuable services to the Royal Institute of Architects, has been wise enough to get married; and some of the members, his personal friends, thought it a good opportunity to recognise those services: so they made a little subscription, and on Friday, in last week, the testimonial, which had taken the place of some plate selected in accordance with Mr. Papworth's wishes, was presented to him at the residence of Mr. Chas. Fowler, who has acted as honorary secretary in the matter. There were exactly fifty subscribers.

THE ENDOWED SCHOOL COMMISSIONERS AND THE SIR WALTER ST. JOHN'S SCHOOLS, AT BATTERSEA.

THE Endowed School Commissioners have just issued a scheme for the future management of the Sir Walter St. John's Schools at Battersea, which, if eventually adopted, will involve the erection of new school buildings at a considerable outlay. Under the proposed scheme there are to be two schools, viz., an upper school and a public elementary school. The governors of the upper school are to sell the site and buildings formerly used for the purposes of the school, but now let, and apply the proceeds, and a further sum, not exceeding 4,500*l.*, to be raised out of the capital funds of the trust, in the purchase of a new site, and in the erection of school buildings suitable for 250 scholars, and the school is to be a day-school exclusively. In addition to a fixed stipend of 100*l.* per annum, the head-master is also to receive payment, according to the number of boys in the school, at the rate of not less than 2*l.*, nor more than 4*l.*, yearly for each boy. The entrance-fee is not to exceed 1*l.*, and the minimum tuition-fee is to be 6*l.*, and the maximum 12*l.* a year. The governors are to hold the present site and buildings for the purposes of the public elementary school, the tuition-fees not to exceed 9d. per week. The vestry and parishioners of Battersea held a meeting in opposition to the scheme, as violating the intentions of the founder, and interfering with the education of the children of the poor, for whom alone the schools were intended. A committee was appointed to consider the scheme, and to draw up a report for presentation to another meeting of the parishioners.

BOLTON TOWN HALL.

WE publish this week an exterior view of the new Town-hall in Bolton, of which we gave plans and a description last week. The columns are omitted on the back (west) elevation; the basement, cornice, and other details being, however, carried round with little or no modification; and the two halves of the structure are precisely symmetrical, except that on the south flank columns square on plan are substituted for circular ones.

The basement, up to the level of the ground-floor string (which formed the first contract), is of Bolton stone; the tower is of the same stone; the principal front is of Halifax and Darley Dale stone, the north and south fronts of Huddersfield, and the west front of Longridge stone.

The tower, which rises 200 ft. from the ground, will be, owing to its comparatively elevated position, in the highest part of the town, a conspicuous object for a considerable distance round the country. The general aspect of the building, and the nature and arrangement of the site, are such as to give an impression of the dignity and importance of the structure, and leave no doubt on the spectator's mind as to its office as the municipal centre of the town.

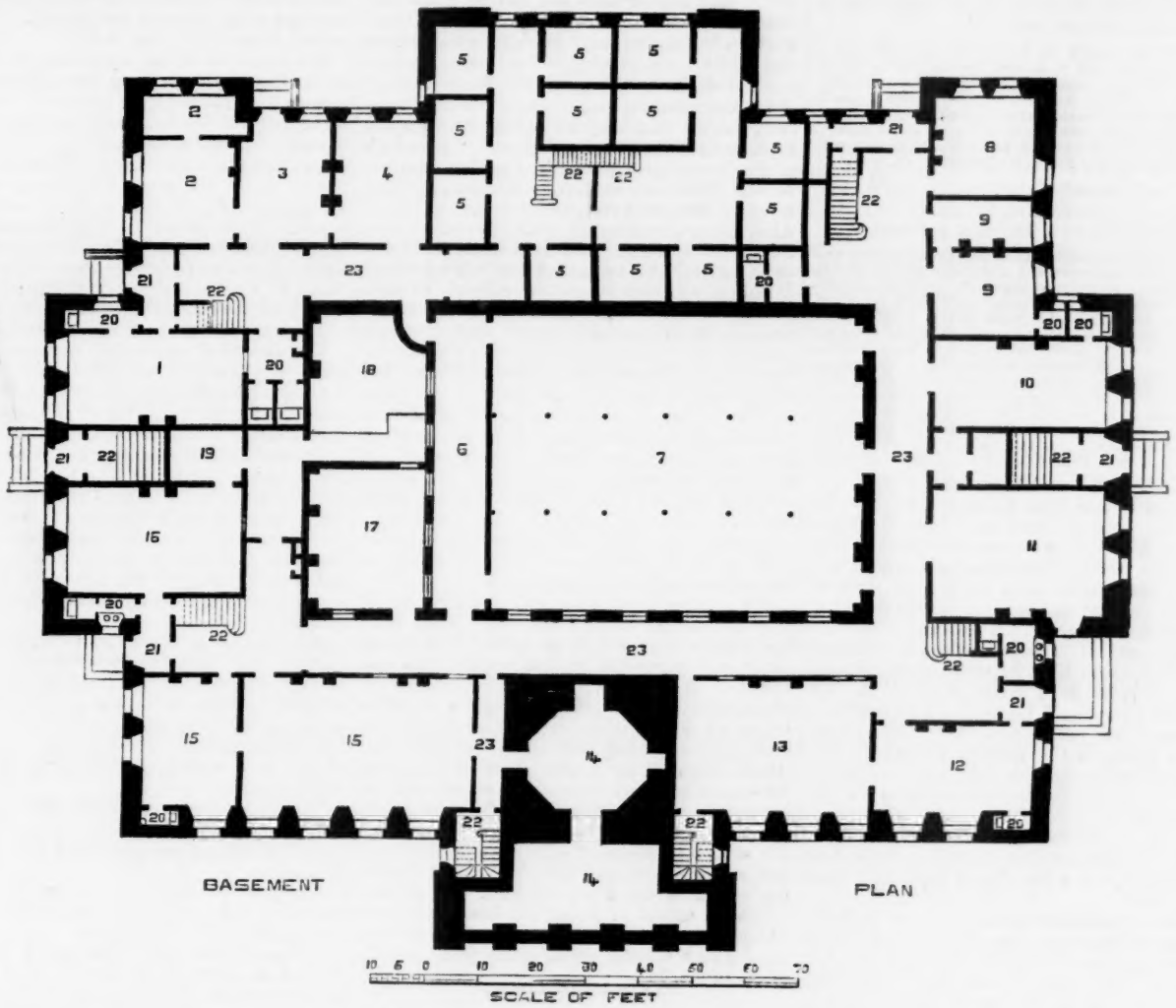
The realisation of the town-hall scheme is the result of very long struggles and aspirations, commencing more than half a century ago, on the part of a rising town; though of course the idea of the present building was only fairly taken up during a more recent period. The original limit of cost was fixed at 40,000*l.*,—a sum which, as our readers are already aware, has been far exceeded in the execution of the design finally determined on. We may hope that this augmentation of expenditure represents a proportionate increase in the prosperity of Bolton, and typifies further progress in the same ratio. We add to the plans already given,* that of the Basement.

THE CICERONE FOR ITALY.

DR. BURCKHARDT, the original author of the book † thus designated, has been long recognised in Germany as an authority on the history of art. The present work, intended as a practical guide for the student of painting in Italy, is now made accessible to the English public through the translation given to us by the widow of the late Arthur Hugh Clough, poet—and something more. In its original form the work was a handbook of architecture, sculpture, and painting; the translation includes the portion devoted to painting. The plan of the book is to give a concise history of the various schools of painting in Italy up to the close of the seventeenth century, especially pointing out the characteristics of the leading painters, their influence on the art and on their successors, &c.; and enumerating their principal works, and the places where they may be seen and studied. The object of the work being something beyond that of a mere guide-book (as the term is commonly understood), the arrangement of the subject is according to schools, and not according to localities; but a double index, of places and of painters, gives a reference to the page and (by means of marginal letters) the paragraph, where information is to be found as to the locality of any painting mentioned, and the paintings of any locality; so that the ordinary office of a guide-book is also fulfilled, at least for those who do not travel *à la* tourist—doing so many picture galleries in a day. The English edition is printed in double columns, in a small but clear type, and thus a very great amount of information is compressed into a volume small enough to carry conveniently in the pocket. The office of the editor, Dr. Von Zahn, has been exercised in regard to the second edition, the author having been occupied with other duties, and he has supplemented the work by contributions from other and more recent sources of information,

* See pp. 417, 426, *ante*.

† The Cicerone; or, Art-Guide to Painting in Italy. For the Use of Travellers. By Dr. Jacob Burckhardt. Edited by Dr. A. Von Zahn; translated from the German by Mrs. A. H. Clough. London: J. Murray. 1873.



1. Detectives (police department).
2. Chief constable.
3. Receiving-office.
4. Police clerks.
5. Cells.
6. Police waiting and dining room.
7. Police parade.
8. Borough analyst.
9. Porter.
10. Medical officer of health
11. Inspector of nuisances.
12. Pay-office, Borough treasurer.
13. Rate-office, Borough treasurer.
14. Waterworks stores.
15. Waterworks offices.
16. Hydraulic engines for organ.
17. Kitchen.
18. Warming apparatus.
19. Store-room.
20. Lavatories and W.Cs.
21. Entrances.
22. Staircases.
23. Corridors and passages.

BOLTON TOWN HALL.—*Plan of Basement.*

with the view of bringing it up as far as possible to a level with the latest and fullest information on the subject which is available. Among the writers who have thus become coadjutors in the work are the late Herr Mündler, Messrs. Crowe and Cavalcaselle, Dr. Frizzoni, Dr. Bode, and the editor, the quotations from each being enclosed in brackets, and distinguished (except in the case of the editor's own additions) by their respective initials. As indicative of the full and precise information conveyed, it may be mentioned, that in many cases, in addition to an analysis of the character and composition of a work, &c., is added an editorial note of the time of day when the best light is on it, no unimportant item of information in the case of many paintings and frescoes placed with little regard to facilities of lighting. Mrs. Clough's translation is, with the exception, perhaps, of a few unimportant sentences, characterised by a clear and expressive English style and idiom; does not, in other words, read like a translation,—a kind of praise which cannot always be bestowed in such cases.

The volume is, however, as we have hinted, more than a guide-book; and whilst giving testimony to its efficacy in this respect, it would be scant justice to mention such a book at all without adding something as to the value of the higher art-criticism contained in it, which would render its perusal a matter of pleasure and profit to many who have not the intention or opportunity of studying Italian painting on its native soil. Dr. Burckhardt's criticism is very broad and philosophic in its tone, and based upon serious considerations of the nature and end of painting as an art, apart from the mere estimate of technic excellence. Some of the reflections occurring incidentally in the course of the work give, in a few words, the key to much which is habitually misunderstood or left out of consideration in the popular judgment on works of art; and, if rightly apprehended, would lead to a much more intelligent study of painting on the part of the average of readers who may make use of such a book than at present exists,—in England, at all events. We note, for instance, in the opening of chapter v., in which the prominent motives of the "Renaissance" are ably characterised, the following observation on the superseding of the church type by that of realism:—

> "Instead of general types of faces we have individuals; the traditional system of expression, of gestures and draperies, is replaced by the endless variety of real life. . . . . In this sense a work of art gives less than the church requires or might require. The religious expression claims absolute supremacy if it is to be successful. And this for a simple reason, which is not always openly acknowledged: *this impression is essentially negative in its character, and consists in excluding everything that recalls profane relations in life*; if these are carefully and on principle introduced into art, as now becomes the case, the picture will no longer appear to be a religious picture."

How much weak talk about "ecclesiastical" and "religious" art would be appraised at its true value, if the idea in the sentence we have italicised were once generally laid hold of, must be evident to some at least of our readers. We commend to the attention of the *dilettanti* of the "ecclesiastical" school, again, the note on p. 90, in which the question as to whether Perugino "really felt as his creations feel" is summarily dismissed as "quite out of place, and an infringement on the eternal rights of poetry":—

> "Many confused ideas prevail concerning the 'profession of faith' of the artist and poet, according to which it would be required that he should constantly carry his heart on his tongue, and in every work give out as complete a programme as may be of his individual thought and feeling. But as artist and poet he needs no other *sentiment* than the very strong one which is needed to give his work the greatest possible perfection," &c.

It is perhaps almost hopeless to expect the popular mind of England, which seems incapable of rising above the mere moralities of art, to comprehend this view of the subject; still the oftener it is repeated the better, especially as in opposition to the overwrought and unreal sentiment about "art and religion" with which we are perseveringly dosed by certain critics. On the other hand, "the entire absence of moral elevation" (a very different thing from "moral *teaching*") in the figures of Corregio, for example, is duly recognised by our author as a distinct and important deficiency in works of art claiming the highest ground. "One is tempted to exclaim,—I myself could have conceived this from a higher artistic point of view." Very suggestive also are the observations on allegory and symbolism in art (p. 39), as *apropos* of the Giottesque school; in the course of which it is observed that "a work of art ought never to be founded on a metaphor; that is, an idea transferred to a new fictitious reality, which gives a necessarily false result in a picture." The author recognises, however, to the full, the importance and grandeur of Giotto's symbolic work, and the distinction which he draws between "symbolism" and "allegory" should be noticed.

In his criticism on, and characterisation of, the greatest names of Italian painting, Dr. Burckhardt is particularly interesting and comprehensive; and perhaps the nature of the power which Titian possesses over us could

hardly be better stated in a few words than in the following sentence:—

"The divine quality in Titian lies in his power of feeling in things and men, that harmony of existence which should be in them according to their natural gifts, or still lives in them, though troubled and unrecognised; what in real life is broken, scattered, limited, he represents as complete, happy, free. This is the universal problem of art; but no one answers it so calmly, so simply, with such an experience of absolute conviction" (p. 185).

This is finely as well as truly said; and we may add the remark further on in regard to a special class of subjects with this great painter:—

"Titian has also in certain nude figures solved other problems of a lofty existence, and at the same time achieved a triumph in the pictorial representation." (After some references to the two famous "Venus" pictures in the Uffizi, the author proceeds.) "Figures of this kind so often mislead modern, especially French, painters. Why are these forms eternal, while the moderns so rarely produce anything more than beautiful nude studies? *Because the motive and import, and the light and colours and form, arose and grew together in the mind of Titian.* What is created in this manner is eternal. The delicious cast of the figures, the harmony of the flesh tints with the golden hair and white linen, and many other special beauties, here pass altogether into the harmony of the whole; nothing obtrudes itself separately" (p. 186).

There is matter here for reflection, both for those who paint pictures and those for whom they are painted. We may add, however, that some of the modern French painters may be said to have realised, to some extent, this unity of conception in the embodiment of the poetry of the nude figure; Ingres, for instance, in his "La Source," so full of delicate sentiment expressed in delicate form; Gerôme occasionally, though in quite another key; Watts, perhaps we may add, in his "Daphne." Our author does not, however, allow his enthusiasm for Titian, "the gigantic figure in the centre of the Venetian school," to run away with him; while observing that there is no intellectual element in the school which he (Titian) does not "somewhere exemplify in perfection," he adds, with the caution and impartiality belonging to a true critical spirit, "he certainly also represents their limitations."

Dr. Burckhardt's characterisation of Raffaelle comes much nearer to the old orthodox idea of this painter, than to that view of him which a school of earnest but rather narrow criticism among ourselves has to a great extent induced, —for the present, at least. "Raffaelle," indeed, he says, "spreads his beauties before us with such directness that every one who sees his pictures, can find his way without a guide, and can carry away a lasting impression. The following suggestions are intended to clear up the sometimes hidden reasons of this impression." In respect, indeed, of this clearness of object and aim, Raffaelle is in painting what Handel is in music; and it must, perhaps, remain always a subject for difference of opinion in criticism, whether the artist who appeals to the simpler and more widespread sense of beauty in material, or he who (like Michelangelo and Bach) gives up his innate grandeur only to more recondite study, deserves to be called the greater or the more valuable in the world of art. That the permanent popular verdict and feeling in regard to Raffaelle, however, will always be in the main nearer to that of Dr. Burckhardt than of Mr. Ruskin, is our own decided conviction. Through the long and elaborate description and criticism on the numerous works of Raffaelle we cannot follow our author, but may quote the following sentence from his final summing up of this painter's status in the history of the art:—

"To Raffaelle, of all men, there is least occasion to forgive anything, or to help him out by assuming something. He accomplishes tasks of which the intellectual premises, not by his fault, lie far removed from us, in a way which seems quite natural to us. The soul of the modern man has in the region of the beautiful in form no higher master and guardian than he. For the antique has only come down to us as a ruin, and its spirit is never our spirit."

The interesting remarks on Leonardo we must pass over merely with the observation, that the author reduces the authentic (completed) works of this artist to a minimum, considering that Italy contains (not counting the coloured drawings), only a single genuine *finished* picture by Leonardo, the portrait of Isabella of Arragon, wife of Galeazzo Sforza, in the Ambrosiana, at Milan. The whole of the chapter on Michelangelo is admirable, and should be read with attention. "Of all that makes life dear to us, there comes out little in his works;" and in regard to his forms, "no drawing, however grand, no expression of power, can make us forget that certain extremes of breadth of shoulder, long necks, and other such forms, are arbitrary, and sometimes monstrous. Certainly, when in presence of his works, we are always disposed to allow Michelangelo a right and a law peculiar to himself." The author does not fail to point out what we noticed in reviewing Mr. Tyrwhitt's work on "Christian Art," some little time since, that Michelangelo, though it has been a fashion to speak of him as the great "Christian artist" of the Renaissance, had, in fact, "severed himself from all that may be called ecclesiastical types and religious tone of feeling." "He revels in the Promethean pleasure of calling into existence all the capabilities of movement, position, foreshortening, and grouping of the human form." After observing that this artist first of all conceived the Creation "not as a mere word, but as an action," it is remarked that "in the whole domain of art there is no other example of such an intellectual living expression of the supersensual by a perfectly clear and speaking sensuous act," as is embodied in the representation of the Creator giving life to Adam. Dr. Burckhardt is not blind, however, to the questionable nature of the influence which Michelangelo's genius exercised (such as genius of so abnormal a character always must exercise) on those who succeeded him. "After his death, all principle in all the different arts was overthrown; every one strove to reach the unconditioned, because they did not understand that what in him appeared uncontrolled in fact took shape from his inmost personality."

We must here take leave of a book remarkably interesting in its class, and replete with information conveyed in a method both systematic and agreeable to the reader. We are indebted to the translator for furnishing us a pleasurable task in going through a work in which we meet everywhere the evidence of a thoughtful and cultivated mind, and an enthusiasm tempered by a true spirit of criticism. We can recommend the book to all who wish to study intelligently the relics of the great epoch of painting which remain in Italy, and join with the author in wishing "to those who may read and approve him, and take him as their companion across the Alps, the calm joy of soul which he tasted in Rome, the remembrance of which comes back to him so powerfully even in looking on the feeble copies of the great masterpieces of art."

SEWAGE AND DRAINAGE WORKS AT WINDSOR CASTLE.

THE "separate system" of drainage, whereby the channels for carrying off the rainfall are distinct from those for conveying the sewage, has been applied to the new drainage works which have just been completed in connexion with Windsor Castle. At the same time further measures have been taken for equalising the levels of the river Thames at different periods of the year, so as to increase navigation facilities, and prevent the danger and injury caused by the annual flooding of the low lands along the banks. The works altogether have taken six years to complete, and have now, under the guidance of Mr. W. Menzies, surveyor of Windsor Park, and Mr. Leach, engineer to the Thames Conservancy, been brought to a conclusion.

In carrying out the works for regulating the level of the river, it was considered necessary not to alter the general level of the water, but to maintain it at its average summer level. The subsoil water on each bank is kept at about 5 ft. from the surface, so as to give as much benefit as possible to the pasturage and trees on the Royal estate. Old Windsor lock and weir have been rebuilt on their old sites, the waterway of the weir being increased, when all the sluices are raised, from 555 ft. to 647 ft., for the river to pass through. Its sill, also, is built 1 ft. 6 in. lower than formerly, thus giving greater facilities for letting off winter floods. At the same time the sluices and hatches have been built higher, so as to admit of the summer level being kept at an increased height of 1 ft. The bed of the river has been also dredged to a uniform depth of 5 ft.

Self-acting tumbling-bays have further been constructed contiguous to the weir and lock, so that whenever the river rises more than 15 in. above the summer level, it can immediately flow off. Similar works have been carried out at Bell lock and weir, and Romney lock and weir, the result of which is that the river can be maintained 1 ft. higher than its original summer level, while the floods can be reduced 1 ft. 6 in. The levels formerly varied about 10 ft.; their greatest variation is now 7 ft. 6 in.: the floods consequently which used to cover so large an area of land on each bank of the river will be controlled to such an extent that, as last winter's experience proved, they will not extend over a tenth part of the land they formerly submerged. The total cost of these works was 16,629*l*.

The works for the supply of water to the whole of the Castle Estate have been simultaneously executed. The water is procured from a well sunk near Old Windsor Lock, the spring supplying which seems to be unfailing. The water is raised into the cisterns, the highest of which is 274 ft. above the river, by utilising the water falling over Old Windsor Lock to turn a water-wheel. This power is supplemented by an 8-horse power engine to be used in case of accident. The water-pipes extend nearly a dozen miles in length, and carry sufficient water to supply all the houses in and near the park.

The total cost of these works was 8,529*l*.

But the most important, because the most novel, of the works, are those which have been carried out for draining the castle and adjoining buildings for the irrigation of the lands, and for the utilisation of the sewage.

Formerly all the sewage and drains ran into the Thames direct, or into the Windsor town sewer. Since the Thames Conservancy ordered the diversion of the foul matter from the river, it was determined to utilise the sewage for irrigation, and to discharge the surface-drainage into the river direct; and the Crown buildings have now a system of drainage distinct from the town system.

An equalising reservoir, to contain 20,000 gallons, has been constructed to hold this sewage, which is carried in 18 in. pipes, with a fall of 3 ft. to the mile, to a small piece of land of about eighteen acres, which has been laid out for irrigation. The levelling and preparing of this land were performed at the large cost of 80*l*. per acre.

The water-supply of 1,000 persons and 500 cattle is about 150,000 gallons a day, the surplus supply unutilised being directed into the lake at Frogmore.

The principal feature in connexion with these works is the pumping-engine, which is thus described by Mr. Menzies:—

"The engines were constructed by Messrs. Easton & Anderson in such a form that they can be worked either by compressed air or steam, a boiler being placed in the engine-house for the purpose. To supply this compressed air, the turbine wheel at the waterworks acts upon a piston and cylinder, which forces the air into a pipe 2 in. in diameter and 425 yards long, leading up to the sewage pumping station; and great economy is thus obtained, as coals will not be required except in special cases. A self-acting float in the sewage reservoir stops the air-engines when the tank is empty, and a safety-valve at the turbine-house then blows off, and at the same time stops the whole compressing machinery, while the pumping of the water for the Great Park goes on as usual. The maximum amount which it was calculated the sewage pumps would ever be called upon to lift would be 200,000 gallons a day of twenty-four hours. This was estimated on the supposition that the whole of the 150,000 gallons of the water supply used at the Crown buildings came down the foul drains; that there was a heavy rainfall on the dung and manure-pits and farms at the royal farms, which drain into the system; and that there was a quantity of subsoil water which would pass into the main drain when it was submerged in flood time, notwithstanding all the precautions we could take to exclude it. Each set of pumps at the sewage reservoir was, therefore, planned to throw 10,000 gallons an hour, whether worked by steam or compressed air, but in a case of emergency double the quantity could be lifted by putting steam to work on one set of pumps and air on the other, or the boiler alone at the same place is sufficiently powerful to drive both sets of pumps for the greater part of the day when working at 50 lb. pressure to the inch."

The cost of these works, including compensation, machinery, embankment, and levelling, part of the charge for rebuilding weir, &c., is 18,119*l*., which brings up the total charge for all the works referred to, to 41,808*l*.

The apparently enormous expenditure is repaid by the substantial nature of the works, and the lasting benefits that will ensue from their execution, as well as in the direct profits that will be made by the increased value of the lands and houses in and adjoining the estate, in the proceeds of the irrigation farm, and the saving of labour in pumping and carting water, to say nothing of the improved sanitary condition, not only of the immediate neighbourhood, but of places further down the river.

BOLTON TOWN HALL.—*From the Design of* Mr. W. Hill; *carried out by* Messrs. W. Hill *and* G. Woodhouse, *Architects.*

THE MEXICAN METHOD OF MAKING HARD LIME FLOORS.*

SOME years since, the writer had occasion to visit Northern Mexico, to examine and work some silver-mines; and, while passing through the Mexican villages, noticed the exceedingly hard and polished lime floors and roofs of the houses.

In the village of Salinas, where our party remained some three weeks, the horses passed daily through the house into the inner court-yard over one of these floors without leaving an indentation, or injuring it in any way. Some time after, having occasion to construct some buildings at La Yguana Mines, an attempt was made to imitate these floors and roofs. Attributing the peculiar hardness and smoothness of the floors to the inherent good qualities of the lime used, no inquiries were made as to the Mexican method of working. A good quality of limestone was selected and calcined in the ordinary way. Shortly after burning it was slaked to a dry powder, and afterwards used as required. A floor was laid with a foundation of about 3 in. of broken stone, over which was evenly spread about 2 in. of mortar, formed of two parts of clean sharp sand and one of lime. The lime was "fat," swelled greatly in slaking, and was not at all hydraulic.

The floor, made as above, was a total failure. At the end of four weeks the leg of a chair would indent it. As soon as the surface was damaged it began to crumble; and soon broke up. It would probably have been about as hard as our ordinary lime mortar if allowed to set a sufficient length of time before being used.

Knowing that the Mexicans used the same materials with better success, their superior skill was called into requisition to lay all the remaining floors and roof of the same building. They used the same sort of lime and sand in about the same proportions, and upon the same kind of foundation. The result was a floor as hard and smooth as a piece of polished marble, that a horse could trot upon without injury.

A brief account of the method of making these floors may not be uninteresting.

The limestone used was a hard, compact blue material, in some places sufficiently hard to strike fire on the drills used in running a drift through it for mining purposes. It often contains iron pyrites in small proportion. This was calcined in kilns cut out of a very soft limestone, that likewise is found in that section of country, and which, on account of its whiteness and softness, is called "cal leche." I believe it is never used for making lime by the Mexicans.

After calcination the lime was removed from the kilns, and slaked as soon as cool. Some of it was used within a day or two, and some remained a month or more in barrels. All the work made with it seemed to be equally good.

In making the floors, a layer of broken limestone, three or four inches thick, was first laid evenly over the surface of the ground, the stone being about the usual size for macadamizing roads. Over this a mortar of about two parts of sand to one of lime was carefully and evenly spread to the thickness of 1½ in. to 2 in.; this was allowed to remain for about twenty-four hours, or until the surface had become quite dry. It would probably take longer in this climate, where the air possesses a greater amount of moisture than in Mexico.

The floor was then thoroughly pounded all over with a tool composed of a block of wood about 1 ft. square and 3 in. thick, having a handle rising from the middle, so that a man could stand while using it. The whole surface was beaten over with this ram until it was again as soft and moist as when first laid. This operation of ramming brought the water in the mortar to the surface so as to form a layer of semi-fluid substance on top.

The floor was again allowed to dry, and again beaten over each day for about a week, when the operation brought only a slight amount of moisture to the surface.

Immediately after the last pounding the whole surface was powdered with a thin layer of red ochre, evenly sifted on, and then polished as follows:—

A smooth, nearly flat, water-worn stone, a little larger than the fist, was selected from the bed of the stream which ran through the place, and with this the whole floor was laboriously gone over, rubbing down, and leaving the surface of the lime as smooth as a piece of polished stone, the red of the ochre rendering it of a rich brown colour.

In less than a week the floors made in this way were sufficiently hard to bear the weight of a horse without indentation. Roofs were made in the same manner, without the colouring matter, which was added only to give the floors a better tint than the gray of the mortar. These roofs were perfectly waterproof, and were unaffected by sun or rain.

In the city of Monterey, sidewalks in the principal streets are made in the same manner, and some of them have lasted for years, wearing through like a block of stone.

The great durability and strength of these floors and roofs are entirely owing to the pounding operation above described, as the same materials were tried in the ordinary way without success.

The writer has not had occasion to make use of this process in this climate, but gives a description, hoping that it may be of value to others who may have occasion to lay floors of lime in architectural or engineering works. He has never heard of this method being employed in this country; although it seems singular that it should be used so generally by a neighbouring nation, and be wholly unknown to our builders.

The following correspondence grew out of the above:—

From Estevan A. Fuertes, C.E., Member of the Society.

A paper read before the Society, upon a Mexican method of consolidating mortars, described as of extreme hardness, suggested to my mind that, perhaps, its author might be mistaken in attributing its main durability and hardness to the slow system of consolidating the road-bed and its cover.

My doubts have grown out of the circumstance that the author says (without seeming to attach much importance to the fact), that ochre, or a similar pigment, was mixed with the mortar.

I think that the colouring matter, believed to be of secondary importance, is the main ingredient which determines the superiority of the cement described; and instead of its being ochre it was underburnt brickdust.

If I am not the one who is mistaken, the consideration of this subject will bring up for discussion the method of obtaining a cheap and superior cement, that, I believe, has not been used much in this country.

The hydraulic engineer has much need of studying the causes which induce the "setting of mortars," because it is almost certain that the resistance of such materials as bricks, limes, and cements, depends upon their conditions of crystallisation.

I am aware of only two methods of hardening the silicates usually employed in hydraulic works, viz., the gradual chemical change (crystallisation in the slow, humid way, as in submerged foundations, &c.), and the quick vitrification under the influence of intense heat, as employed in brick-making.

It is notorious that under-burnt brick resists very badly the influence of atmospheric wear, especially near salt water. I have crumbled in my hand an under-burnt brick, one year after its exposure to sea spray, and gunpowder was manufactured from the nitrate of potassa formed upon its porous substance; but the same clay burned with chalk, making a double salt of carbonate of lime and silicate of alumina, or rather a sub-crystalline double silicate of lime and alumina, after being ground, made a cement susceptible of receiving a splendid lustre, and withstood the action of the spray and of the waves without apparent change.

Both the limestone and the brick had been used separately as building material in a burying-ground near the sea-shore, where the experiments were conducted in 1861. Eighteen months of exposure for the stone, and twelve months for the brick, were sufficient to render both materials useless; but when burnt, ground, and mixed, they stood much better than the finest and distinctly crystalline marbles.

At the end of three years, or more than the sum of the times of durability of each material, I left the place where the experiments were made, and then the cement had not changed where the surface had been left rough, nor tarnished where it had been polished.

A cement called "Revocado" by Spanish engineers is made by mixing in several proportions fat limes with sand and under-burnt brick-dust. The usual proportions are measured by equal volumes of the three materials; but when the cement is to be used for stopping roof leaks, cementing cellars, or where blows upon the cement are not anticipated, the proportion of sand is greatly diminished, and even suppressed altogether.

The Spanish learned the compounding of this cement from Biscayans probably; and I doubt if the Romans had anything to do with its introduction in Spain, because the ruins of ancient water-channels with "revocado" exist in the Basque provinces, where neither Romans nor Moors ever penetrated. The Biscayans, in their turn, are the most ancient people with whom we are acquainted, it being probable that they preceded the Phœnicians.

I have seen Spanish "revocado" in Mexico, and it is natural to suppose that the Spaniards introduced the art in that country during the Conquest.

Now, may it not be possible that the ochre referred to by Gen. Ellis is only powdered brick, used to make the excellent and hard "revocado"?

The description given of the method of consolidating the mortar, &c., and even the employment of wooden compressors, explain accurately the process still followed in Spanish countries to form the floorings of plazas, public walks, &c.

In many cases, immediately before the cement becomes set, its surface is polished with a smooth cobble-stone until it acquires a high and lasting lustre.

From Gen. Ellis, in reply to the above.

Having read the remarks of Mr. Fuertes upon my recent paper relating to hard lime floors, I apprehend that he did not give sufficient attention to the process therein described.

In no case was the red pigment mixed with the lime and sand, as he supposes, but was solely used for a surface-colouring after the hardening process was completed. Roofs and sidewalks of equal hardness were also made by the same process of successive poundings without the colouring matter, and finished by polishing in the same manner as the coloured floors.

The pigment used upon the floors was not brick-dust, but a red earth found in the vicinity, probably a fine clay coloured with sesqui-oxide of iron. Bricks were not used in that part of the country; "adobes" taking their place in building.

It will thus be seen that the material of which the described floors and roofs were made was not the same as the "revocado" used in Spain and Southern Mexico, described by Mr. Fuertes. Is not the term *revocado* essentially the same in meaning as the more common Castilian word *revoque*, one being the participle and the other the noun corresponding to the Spanish verb *revocar*, the nearest English equivalent to which, in an engineering sense, is to *rough cast*? This implies an admixture of coarse material in the mortar. "Revoque" was known to the Romans as "*parietis linimentum*."

Mr. Fuertes is, I think, in error when he attributes any rapidity of setting, greater hardness when set, or improved hydraulic qualities, to the mixture of burnt or under-burnt brick in any proportions with lime. The experiments of Smeaton show conclusively that the only gain is the slight amount of moisture that the brick will absorb from the lime and favour its *drying*.

The only way in which hydraulic properties can be given to a compound of silicate of alumina and carbonate of lime is by burning them together after being mixed, as in the production of artificial cement. This is exactly what was done in the case Mr. Fuertes recounts; clay and chalk were burned together, and, if in proper proportions, would form an excellent artificial cement. It is not remarkable that neither should be a good building material by itself.

If the "revocado" of the Spanish possesses any quick-setting or hydraulic qualities, it is probably not owing to the admixture of common brick, but to some qualities of the lime, or perhaps what Mr. Fuertes has taken to be brick was artificial "trass," formerly much used, which was burned like brick, and, when added to mortar, gave it hydraulic properties.

I think it highly probable that the process of pounding ordinary lime-mortar for many successive days in order to give it hardness, and afterwards polishing the surface, originally came from Spain to Mexico, and is probably an ancient practice. The only matter of surprise

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* From a paper by General T. G. Ellis, C.E., read at meeting of the American Society of Civil Engineers.

is that it has not become more generally known and used.

Note by the Printing Committee.

Is this "pounding process" of the Mexicans anything more than a simple yet effectual method of freeing the mortar of its *surplus water*, and thereby insuring a condition in which the lime can pass to a crystalline carbonate, at the same time compacting the whole mass into the best possible state?

WATER IN ROME.

IN the course of a lecture last week on Roman antiquities, delivered at the Royal Institution, Albemarle-street, Mr. J. H. Parker said,—The celebrated Aqua Marcia has recently been again brought into Rome, and is rapidly coming into use, being considered the finest drinking-water in the world, always cool even in the hottest weather. At its source it is so intensely cold that, in the hot summer weather of Italy, a glass tumbler put suddenly into it will break in the same manner boiling water will break a tumbler in frosty weather in London. The company which has now brought this excellent water again into Rome consisted chiefly of English capitalists, and the late Mr. James Shepherd, an Englishman, has the chief merit of the direction of the works. The engineers found it expedient to adopt the old plan of the Empire. For the first ten miles of its course, as far as Tivoli, it is carried in a stone specus, and on arches where necessary, just in the old manner. But after descending the hill at Tivoli (avoiding the cascades by a considerable *détour*), where it arrives at the level of the low hills of Rome, it is carried in large iron pipes in order to avoid the still greater *détour* which the old aqueducts took to keep clear of the streams that cross the line, and fall into the river Anio. The water of that river, which falls into the Tiber about two miles above Rome, is always distinguished from that of the Tiber itself by being clear, and contrasting strongly with the muddy, yellow water of the Tiber. The water of all the early aqueducts was that of springs which fell into the Anio, and were intercepted and forced to flow through Rome.

The earliest was the Aqua Appia, made B.C. 312, the sources of which are in the meadows of Lucullus, about seven miles from Rome, at a low level; one of the springs is in the fine old stone quarry on the bank of the Anio, called the caves of Cervaro, from which it is believed that the great tufa blocks for the great wall of Servius Tullius had been taken. This was, therefore, an old stone quarry made centuries before the time that the earliest aqueduct was made.

The course of this earliest aqueduct was entirely subterranean, and at a considerable depth until after it had entered Rome and had passed for a mile under the Cælian Hill when it had to be carried across the deep valley from the Cælian to the Aventine, where Mr. Parker found it during his excavations in 1868, carried over the Via Appia upon the Arch of the Porta Capena; and a portion of the specus remaining in one of the towers of that gate, now a gardener's cottage. He traced it again in a subterranean stone quarry under Santa Sabba, and from thence under the Aventine Hill to its mouth near the Marmorata and the Porta Trigimina on the bank of the Tiber.

The Aqua Virgo was made by Agrippa in the time of Augustus, and came from the same meadows about a mile further from Rome, where also several springs are collected in a large central reservoir, and then carried in a specus to Rome. Both of these streams bring a great deal of clay with them, the soil of the meadows being clay upon the tufa rock.

The specus of the Appia is filled up with clay to the depth of 2 ft., or one-third its whole height, as may be seen in the stone-quarry; this clay is a deposit left by the water, and was probably the cause of its being abandoned, as it was too deep to be destroyed by the Goths or other enemies. The Virgo was restored to use by the Popes, and is now called the Aqua di Trevi, having for its mouth the celebrated fountain of Trevi. The Anio Vetus was another spring that fell into the Anio below Subiaco, and twenty miles above Tivoli; its course was almost entirely subterranean, though it can be traced by means of the wells that fall into it. The Marcia also comes from the same neighbourhood below Subiaco, but the spring there forms a small lake about half a mile from the river. The Tepula and the Julia come from the Alban Hills, near Marino, and are added to the Marcia at the great piscinæ or filtering-place, where all the earlier aqueducts emerged from the hills at the level required. From that point the arcades are made to carry them across the Campagna until they enter the wall of Rome. They are then carried upon the high bank of the Tarquins as far as the Prætorian Camp, and thence across the Pomerium to the centre of the great Agger of Servius Tullius on the Viminal Hill, where they were found with inscriptions relating to them on two Cippi during the excavations of 1870 made to enlarge the railway station; there was a large reservoir at that point from which the water was distributed. The Claudia also comes from Subiaco, just above it, and was also a copious spring intercepted. But the Anio Novus is part of the river Anio itself, two miles higher up, where a fine cascade falls over the rock in a deep rocky gorge. Here great engineering works were made in the time of Claudius and Nero. A great wall, 12 ft. thick, built of large blocks of stone, was erected across the river at the lower part of the gorge, forming a dam of 100 ft. high and 12 ft. thick, to enclose a portion, perhaps 100 yards long, between the dam and the natural cascade; the water was made to fall over the dam, which thus became the cascade; but at one end of it a specus was made below the level of the surface of the water, so that the water must always flow through that specus, and consequently through Rome, before any of it could fall over the cascade. This magnificent and most useful piece of engineering continued in use for centuries. It was destroyed in the fourteenth century by an ignorant monk, who was annoyed by a temporary flood in the upper country, which overflowed the meadows near his monastery, and, to relieve that, he made a hole at the bottom of the great dam. The force of the water soon carried all before it, and caused a great flood over all the lower country, even to the Tiber, and did immense mischief—even the walls of Rome were injured.

Mr. Parker said that he had not time to describe the thermæ, or great public baths, to supply which most of the aqueducts were made, but he could not conclude without mentioning that the opinion commonly entertained, that the ancient Romans were ignorant of the fact that water will rise to its level, is entirely a popular delusion. At every half-mile of the aqueducts, on their course from the foot of the hills to Rome, each aqueduct forms an angle, to break the force of the water, and at that angle a great reservoir is made, with a piscina or filtering-place at one end. Each piscina consists of four vaulted chambers, two above and two below. The water enters into the top of the first upper chamber; it then falls through a hole in the vault into the first lower chamber, then passes through small holes in the intermediate wall into the second lower chamber, then rises again through a hole in the vault into the second upper chamber, and then follows its course at the same level as it originally entered, depositing its mud in the lower chamber as it passed. Each piscina is therefore made upon the principle of water finding its level.

They used the large stone specus instead of ordinary pipes, because they could not depend either upon their leaden pipes or their terra-cotta pipes to resist the force of such a stream of water. Nothing but the concrete stone was strong enough.

At the present time, the cast-iron pipes of the new company are bursting every day in the streets of Rome to such an extent that the managers of the company fear that this expense will be ruinous to them. This seems to show that the old Romans were better engineers than we are.

Rational Gymnastics.—A tract has been issued by Baillière & Co., of King William-street, Strand, titled "Rational Gymnastics reviewed in their relation to the Health and Education of the Younger of both Sexes, being the Subject of a Lecture delivered before the National Health Society; by Augustus Georgii, formerly Professor of Anatomy and Sub-director of the Royal Central Institute for Gymnastics at Stockholm, &c." The author proposes that physical, no less than mental, education be equally extended to and compulsory for both sexes; and that normal schools be established for teaching gymnastics as an art and a science, in connexion with suitable anatomical and physiological instruction.

THE ROYAL ARCHITECT, "CHAUCER."

SIR,—The presumed son and family of the poet, Geoffrey Chaucer, having lately formed the subject of an article in the *Builder* (No. 1578, p. 351), it may possibly be interesting to your readers to be told that the poet himself came as near to being formally appointed architect to King Richard II. as the language of his age permitted. That is to say (on the authority of his life by William Godwin, 4 vols., 1804), that he was in 1389 appointed to the office of Clerk of the Works; and a Latin document is cited in which the works at Westminster Palace, the Tower of London, and at various other places specially named, are placed under his care, together with another document in which there is assigned to him "*capellam nostram collegialem Sancti Georgii infra castrum nostrum de Wyndesore, que minatur ruine, &c.*"

It will be new to some readers to find that not only was St. George's Chapel at Windsor built, but it was threatening to go to ruin, in the fourteenth century.

The poet did not hold his office, it would appear, longer than about twenty months. With regard to his special qualifications for it, the history is silent. He was entitled to the assistance of a deputy, for whom a salary was provided by the Crown. His own salary was 2*s.* *per diem*,—equivalent, it is reckoned, to 657*l.* a year in modern money. He had been, at a previous period, comptroller of the customs for the port of London.

With regard to the term Clerk of the Works, it may not be generally known that the architect to the Corporation of London was only officially known as "Clerk of the City's Works" until within the last thirty years. Previously to that time expressions like the following were to be heard in common use at the Office of Works, Guildhall. "Is the Clerk of the Works in?" "The Comptroller sends his compliments to the Clerk of the Works, and would be obliged by his stepping over if disengaged"; or, perhaps, in a thundering tone, "The Clerk of the Works is wanted immediately in the Court of Aldermen," &c. The Royal "Clerk of Works" appears in the reign of Charles II. to have grown into "Superintendent and Surveyor"; for so Sir John Denham, another poet, is described by Evelyn.

G. M.

A NEW TEMPERANCE HALL FOR BURY.

THE teetotallers have now begun to build a new temperance-hall in Henry-street, Bury. The height of the building in front will be 35 ft. It will be 35 ft. wide, and 84 ft. long. It will be two stories high, and the frontage in Henry-street will be of seconds brick, with stock brick dressings and Burnley stone cornices, sills, &c. In the upper story in the front will be twelve windows, while on the lower floor there will be a window on each side of the main entrance. On the ground floor there will be a room 33 ft. square, suitable for "Good Templars" to meet in, and in it there will be a horse-shoe shaped gallery. It will be fitted up with all furniture necessary for conducting meetings. Behind the lodge-room there will be a room 33 ft. wide by 17 ft. long, which it is intended to let off for the use of Oddfellows or others as a club-room. On the first floor there will be a large assembly-room, 33 ft. wide by 65 ft. in length, having in it a platform at one end, and a gallery at the other. The height of the room will be 22 ft. Under the platform will be a room for the preparation of tea, and at the back there will be three retiring-rooms. The inside will be finished plainly, the timber fittings being simply varnished; the walls will be coloured and finished with stencilled ornaments.

It will be erected from plans prepared by Messrs. Maxwell & Tuke, architects.

The contracts for the different portions of the work have been entered into as follows:—Brickwork, Mr. Samuel Smith; joinering, Mr. Charles Green; plumbing, Mr. T. Caton; stonework, Mr. James Hill; slating, Mr. John Kay; and plastering, Messrs. Lomax & Sons.

The entire cost for the erection of the building will be 1,600*l.*

The Albion Tavern.—According to the *City Press*, the freehold of the Albion Tavern has just been acquired by the directors for the shareholders, who are thus possessors of the freeholds of both this and the London Tavern.

THE NEW LARGE RESERVOIR AT OSWESTRY.

THIS undertaking is now in a fair way of being placed in such a position as to justify the additional expenses to be incurred. The original estimates for the work varied from about 800*l.* to 1,900*l.*, and to make the "big hole" at the Mount upwards of 1,800*l.* has already been expended, which, with the cost of the land, 200*l.*, makes a total of 2,000*l.* "The hole," as stated, has been made sufficiently large to store six million gallons of water; and after great pecuniary loss on the part of one of the contractors, and sacrifice of time to his surety, and after a formal opening two years ago, no sooner was the water let into it than the steps gave way, and the water was of the colour and nearly of the consistency of mud. The wet weather coming on, the banks, or "batters," all fell in, and, as a reservoir, it was perfectly useless. It has remained in this dilapidated state until the work has been commenced upon it. Mr. J. Ward has undertaken to make a long puddle wall, to keep out the water from the springs and drains of the adjoining land, to remake the dilapidated banks and drive piles into them, and to line it inside with 6 in. of concrete, for 1,350*l.*, by the 29th of September next. A number of men are now engaged upon it. When this reservoir is completed there will be a storage in the three reservoirs of ten million gallons of water. Supposing them to be all full, they would supply each person in Oswestry with ten gallons of pure water a-day for twenty weeks. The total cost will then be, in round numbers, 3,500*l.* On behalf of the corporation of Oswestry, Mr. George Owen, C.E.; Mr. John Morris, builder; and Mr. W. H. Spaull, architect, have consented to inspect the works during their progress.

MONUMENTAL.

THE statue of John Bunyan which Mr. J. E. Boehm was commissioned by the Duke of Bedford to execute for the town of Bedford is far advanced towards completion, and promises to be a fine work. The pose of the figure, which is of heroic size, is easy and natural; the hands hold a book; and the face upturned to heaven suggests the inspiration to which Bunyan's remarkable production is often attributed. The folds of the short cloak of the period, carefully modelled, serve to give variety and elegance of form to the back of the figure. When completed, the model will be produced in bronze, and will stand on a pedestal, which should not be too lofty, in St. Peter's-green, and will bear *relievi* on three of its sides. Mr. Boehm has just now finished a recumbent statue of the late Duke of Kent, intended for St. George's Chapel, Windsor, and has in progress, amongst other works, an elegant bust of Mrs. C. J. Freake.——A statue of the late Earl of Derby, which has been executed by Mr. Noble, was unveiled on Tuesday at Preston by Colonel Wilson-Patten, M.P. On the same day Lord Houghton unveiled a statue of the late Sir Robert Peel, which has been raised in St. George's-square, Huddersfield.

COMPLETION AND OPENING OF THE NEW GLOBE BRIDGE AT PECKHAM.

THE new bridge over the Surrey Canal in the Commercial-road, Peckham, which has been for some time in course of erection, and respecting which difficulties and misunderstandings have transpired, already mentioned in the *Builder*, has at length being satisfactorily completed, and taken over from the contractor by the Camberwell Vestry, who have officially declared it open for traffic.

The bridge has been erected on the site of the old bridge, which was a narrow, inconvenient brick structure, only 12 ft. in width, whereas the new bridge is 40 ft. in width. The abutments are of solid brickwork, built in cement on a foundation of concrete, carried 2 ft. below the bed of the canal, and are faced above the water-level with red pressed bricks, and stone dressings. The roadway over the bridge is carried by nine segmental-arched girders of wrought-iron, and is protected on each side by a cast-iron ornamental parapet railing.

The approaches are by easy gradients from Hill-street and Commercial-road, but the communications with the tow-path are by sharper side gradients, supported by retaining walls, on which an ornamental hand-railing is fixed.

The bridge has been erected from designs furnished by Mr. James Dredge, C.E., of Buckingham-street, Adelphi; the contractor being Mr. S. S. Peach.

THE TRADES MOVEMENT.

London.—A strike is imminent.

Whitehaven.—The journeymen joiners have addressed a circular to their employers, intimating that at a meeting held by them on the 7th ult. the following resolution was agreed to,—"That we solicit you for an advance of 3s. per week on our present rate of wages, knowing all trades of the surrounding country are on the advance, and the prices of victuals and other materials being so high we think it a just demand." The notice for an advance was to expire on the 7th of June. The present rate of wages in Whitehaven for journeymen joiners is about 30s. weekly.

Oswestry.—The stonemasons who have been on strike at the parish church have gone to work, a compromise between the contractor and the men having been effected. Twenty-eight of the men demanded a rise from 28s. a week to 30s., and a reduction of one hour a week. The terms on which the men returned are 29s. a week, being an increase of 1s., while the hours of labour remain unaltered.

Montgomery.—The strike of the Montgomeryshire joiners at Forden Workhouse has terminated in a compromise. The men demanded an increase of 3s. and a diminution of two hours in the week. The contractor offered them 2s. rise, but no alteration in time. This they refused; but they have now agreed to the contractor's terms, and work is resumed.

THE POSSIBLE STRIKE.

SIR,—In a recent article entitled "The Chances of another Building Strike," the writer states that we "are acting with a view to enforce another increase of wages." The facts, so far as the masons are concerned, are these:—We have given the employers six months' notice to fulfil an agreement entered into last summer, viz., that if trade was at all good this season, we should have one halfpenny per hour advance. That was part of the compromise accepted by the masons in settling the dispute of 1872. The description of the demoralisation, mistrust, and suffering of the men certainly does not apply to our trade; for the result of the lock-out was a gain of over 100 new members to three London lodges. Their pay for the time lost was 16s. per week.

Again, it is stated that "to strike without the Society's approval, we should not be supported by its funds." I beg to state that should the employers not fulfil the promise given last year, we shall certainly take measures to obtain the advance on the date given in the memorial, the sanction of the Society having been obtained some two months since. In addition to that, we have now a large local fund sufficient to make up a weekly payment of 1*l.* per man.

The article goes on to say that "there are hundreds of masons working overtime, and the societies are powerless to stop them." I defy the writer to prove the case in a single instance, unless they are being paid time and a half.

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HENRY BROADHURST, Stonemason.

THE COOKERY CLASS AT SOUTH KENSINGTON.

SIR,—The visit of School Board girls to the class for Popular Cookery at the Exhibition was noticed in your last number with some kind and judicious remarks. If the children of our poorer friends are to profit much by the excellent teaching given on such occasions, it will undoubtedly be desirable, as you point out, that the viands they are taught to prepare should be, in general, what they will be most likely to meet with in their ordinary life.

But on this first occasion of an organised effort in this direction the object of our visit was rather to test the amount of interest which would be excited, without special provision for the particular audience, and to see how much of attention would be given at the time, and the recollection afterwards of the information imparted. In all these ways the first experiment was very satisfactory, and the written accounts of it since sent to me by the ten pupil teachers who were present show that our object was fully attained.

Nothing "advertises" so speedily as a number of young girls talking of an event, and I am sure that when the next and more methodical step is taken, whereby selected girls may attend a series of five or six lessons properly arranged, we shall have many eager applicants for this useful education. But already enough is surely evident to prove that a permanent "School of Cookery" should be at once established, where young women could learn from good teachers, and could then be admitted to practising classes and examinations, and to certificates, and even diplomas, if such a grave Greek word is proper to denote women who can boil potatoes.

In seven cruises, far away and entirely alone, I have learned much of cooking, but with dire sufferings sometimes, which a few preliminary lessons would have saved. J. MACGREGOR.

SUDDEN DEATH OF AN ARCHITECT.

WE regret to have to record the death of Mr. T. B. Jones, of the firm of Jones & Solomon, Whitehall-place, which occurred suddenly on Sunday evening last, at the house of a friend. Mr. Jones was in company with some professional friends on Saturday afternoon, and conversed in his usual manner. The writer of this was almost the last person who spoke to him when he left for home between six and seven o'clock. On the Sunday afternoon he went to pass a few hours with a personal friend at Chelsea, and during a conversation, without uttering a word as to the attack, he merely leant back on his chair, closed his eyes, and expired. His stillness was instantly observed, and medical aid procured with all possible haste; but of course with no avail. Mr. Jones had long complained of suffering from disease of the heart, and at the inquest, which was held on Tuesday, that fact was established; the verdict was, therefore, in accordance with it. He was about forty-two years of age, and leaves a widow and four children to lament his loss. At the time of his death he was engaged upon the working drawings of the large asylum about to be built at the expense of Mr. Holloway, at an estimated cost of 70,000*l.* The funeral will take place in the Brompton cemetery on Saturday, the 7th instant.

RENOVATION OF ST. GEORGE'S HALL, BRADFORD.

THIS hall is undergoing a "spring cleaning," and is to be repainted and gilded from floor to ceiling. The organ is to be put into a state of efficiency, the ventilation and warming-apparatus is to be improved, and the system of lighting to be altered. Messrs. Lockwood & Mawson have prepared the drawings for the decorations, which will be carried out by Mr. Henry Briggs, of Bradford. Their general character is based upon the Pompeian style, and the work will be treated in broad, firm tones of colour. Hitherto the painting of the hall has been in light shades, which very soon became obliterated by smoke and dirt. The great object of the present scheme of decoration, has been to give the hall an entirely different character, still preserving its architectural features.

The wall round the area is to have a dado, 4 ft. in height, in black, divided into panels, with gold and small scrolls at the corners, the base below being in maroon. From the top of the dado to the cornice underneath the stalls, the walls will be in Pompeian red, divided into courses, with fawn-colour lines. This part of the wall also will be divided into panels, in the centre of each of which will be a wreath, enclosing a blue ground, on which will be inscribed in letters of gold the names of the great composers. The divisions of these panels will correspond with the trusses which carry the front of the stalls. The groundwork of the face of the stalls and the cornice beneath will be in cream colour, and the ornamental work will be enriched with pale green bronze, picked out with blue and gold. The partition at the back of the stalls will be in Pompeian red, as also will be the walls round the galleries and the orchestra. The front of the gallery will be treated in almost exactly the same manner as the front of the stalls, and the supporting columns, caps, and brackets will be in pale green bronze relieved with gold. The mouldings round the gallery walls and windows will be in cream colour, with

a blue fret and light maroon rosettes underneath. The windows and the railings will be bronzed, and the seats and woodwork will be painted fawn colour and varnished. The general colour of the great cornice round the hall will be cream, the trusses and moulding in pale green bronze picked out in gold. The ceiling will be similarly treated, the groundwork of the panels being in blue-grey, and the beams and mouldings in cream colour relieved with blue and gold. The pilasters at the orchestra end of the hall will be cream colour, the groundwork of the panels being blue and the rich scroll ornament and surrounding moulding in gold. The masks in the centre of the pilasters will be in bronze and gold, the capitals will be in bronze, and the figures supporting the lights will be bronze relieved with gold. The general colour of the organ will be cream colour. The pipes will be pale green bronze, diapered in gold, and the trellis work in the panels will be regilded. The cornice and capitals will be picked out in blue. The orchestra front will be treated in cream colour, black, blue, bronze, and gold. The saloon, corridors, staircases, vestibule, and ante-rooms will all be repainted and decorated in uniformity with the hall.

The hall will be lighted by four large patent sun-burners from Messrs. Strode, of Regent's Park. These will be surrounded by large upright flues carried directly through the roof, and will be so disposed that the products of the gas will pass at once into the open air. Separate flues will also be provided round the centre one. New heating apparatus will be supplied by Mr. Clapham, of Keighley.

FIRE-PROOF FLOORS.

SIR,—I read occasionally the *Builder*, and have never noticed any remark having been made on the construction of fire-proof buildings by the use of Cones. There are two sizes of these, 9 in. by 4½ in. and 4½ in. by 4 in. They are hollow, like garden-pots, made with pure red earth, and resist heat. They were used at Buckingham Palace. WILLIAM WHITEHEAD.

*** Some years ago these floors, as constructed under the late Mr. Nash, were described in our pages.

THE BUILDING STONES OF THE NORTH OF IRELAND.

AT a meeting of the Belfast Architectural Association, Mr. J. Lanyon in the chair,

Mr. W. Gray read a paper on "The Building Stones of the North of Ireland, geologically considered."

Mr. Gray referred to the connexion between geology and architecture, and showed that it was important, if not absolutely necessary, for an architect to know something of geology, so that he might be the better prepared to know where to find and how to use his materials, so as to secure variety and beauty in his designs, and strength and durability in his structures. Mr. Gray then gave a general description of the geology of the North of Ireland, and of the various strata exposed, noticing more particularly the formations which are capable of yielding building stone, referring to each bed in descending stratagraphical order. The marked peculiarity of the North of Ireland is the occurrence of extensive beds of trap rock, so well known in connexion with the Giant's Causeway. The same rock extends over an area of about 1,200 square miles, not in one solid bed of rock, but in a number of irregular beds, each having been originally poured forth as volcanic lava, mud, ashes, &c., either in the worn surface of the chalk or under water. Mr. Gray explained that the trap rock usually made damp walls, not because the stone admitted wet through its substance, but because of the defective mode of jointing the masonry; properly built, the trap would be impervious to wet. Below the trap there occurred a whole series of stratified rocks, such as the chalk, greensand, lias, and new red sandstone. Between the greensand and lias is the proper position for the oolite series, including the Bath and Portland stones: but in the North of Ireland this series is entirely wanting. The new red sandstone yields the Scrabo and Dundonald stone, which is also represented at various other points, such as the Gas Works, Belfast; Dunmurry river, Moneymore, and Moira. Under the new red comes the carboniferous series represented by the sandstones of Dungannon, Cookstown, Dungiven, Donegal, and Ballycastle; all of which come from the upper portion of the carboniferous system, the lower portion yielding the limestones of Armagh, Castle Espin, Tubbermore, Dundalk, &c. The old red sandstones occur below the carboniferous, and are possibly represented by the sandstones of Cushendall, and, doubtless, some beds in Tyrone. The silurian formation occurs chiefly in County Down, and furnishes the compact stone of Ballygowan quarries, and the slate of Greyabbey. Mr. Gray then described the various descriptions of granite, particularly the very excellent examples from Castlewellan, Newry, Bessbrook, Gorawood, and Donegal, and demonstrated that we had in our locality a variety of granite which in quality or quantity are equal, if not superior, to the granite of any other place in Great Britain.

THE NEW FISH MARKET, OLDHAM.

THIS new Fish Market has just been opened. The Corporation, more than twelve months ago, determined to erect a small market for the retail of fish adjoining the present market, and consequently decided to advertise in competition to architects for drawings, two premiums being offered. The designs of Messrs. Mangnall & Littlewood, architects, Manchester, were selected, and they were instructed to prepare the working drawings. The building was commenced in February, 1872, and is now completed. The size of the market is 80 ft. in length by 40 ft. in width, with ground-floor and basement, the ground-floor being set apart as the market, which is lighted chiefly from the roof, with north lights. The roof has three bays, the construction being a combination of cast and wrought iron, and timber. The market is fitted up with stalls formed of polished stone bearers and Sicilian marble tops, with moulded nosings. The framing above the stalls for carrying the poultry and game, &c., is of wrought iron, of simple construction. The stalls are divided so that they can be let to twenty tenants. The contractors for the construction of the buildings, except ironwork, were Messrs. Greenup & Watts, of Manchester. Messrs. Mabon & Co., of Manchester, were contractors for the ironwork to roof and gates, &c.; Messrs. Wolstenhulme & Rye, the ironwork for ground-floor; the marble and stone fittings were by Messrs. Pattensons, of Manchester; and the wrought iron in connexion with fittings, Messrs. Hibbert & Co., of Manchester. Mr. David Jackson, of Oldham, has carried out the flagging. The total cost of the market has been about 2,200*l*., and about 500*l*. for fittings.

THE DESIGN FOR NEW SCHOOLS IN OXFORD.

IN a convocation held on the 23rd ult., Mr. Scott's design for the new schools to be erected in the High-street was submitted for approval.

Mr. Fyffe, of the University, as reported in the local *Journal*, entered into a lengthy criticism of the plans. He objected to the smallness of the quadrangle, necessitated by the proposal to erect a complete building on the site now available, rather than providing for gradual completion. The quadrangle would be only one-sixth the size of that at Magdalen, one-half the size of Lincoln quadrangle, and yet the buildings would be much higher. The courts of Whewell's buildings at Cambridge showed what would be the gloomy results. The cloisters, too, would be both narrower and lower than those of Magdalen, and their unnecessary introduction was probably the reason for a top-heavy elevation. Of details there were more than in all the colleges put together. Not a feature but was a reduction and a parody of something else in Oxford. As to the court, progress from door to door was only possible by "cannoning" off a pillar. The design made no provision for extension. The elevation towards the High-street embraced with other elements that of a church. It did not harmonise with the other academical buildings of the High-street, but faintly only with St. Mary's. Mr. Fyffe went on to suggest how the ground available might have been more satisfactorily treated, his essential point being prospective and not present completeness.

Professor H. Smith warned members of the difficulties they would incur by the rejection of the design. One architect of name had given as his reason for refusing to compete,—the treatment of the previous design. He urged the following points:—Do not mistrust first impressions; do not reject ornament because it is useless; do not compare schools with colleges. In the one "we live and lounge and smoke:" of the other we are temporary visitants. Consider, also the difficulties of the ground, and of getting more, and the necessity of a front to the High-street. There is no complaint as to the amount of examining space; in short, the design is good in itself, but there is a stronger reason for accepting it,—it would be difficult to get a better.

The Principal of St. Mary Hall would vote against the design, as a "complete plan on an incomplete space."

Dr. Acland desired to follow his first impression, which was that the design was unworthy of the object and of the site. He compared it with the Examination Buildings at Burlington House. The better way of getting a design would be to select and trust some one man. He criticised the condition of the High-street,—All Saints' Church unspired, the new buildings opposite unworthy of Manchester warehouses, and a huge gap below to be filled up by a façade entirely unworthy of the external expression of the interior work of a university. We should follow in preference one of our serious, simple, unpretending academic fronts.

Mr. Rogers knew nothing about art, he was thankful to say. It was high time to get rid of "eminent architects." Oxford had suffered long enough from them, and from the imbecility which characterised their productions.

The design was rejected by fifty-four votes against twenty.

COMPETITION.

Deaf and Dumb Asylum, Margate.—The premiums offered in this competition have been awarded as follows:—100 guineas, 1st, Messrs. Drew & Bower, of Margate; 50 guineas, 2nd, Mr. Thomas Henry Watson, London.

ACCIDENTS.

Caution as to Balconies.—These, especially in old houses, are often traps for the unwary. A shocking and fatal accident has happened to Mr. James Simon, an architect, son of Mr. Serjeant Simon, the member for Dewsbury. Mr. Simon was visiting at the house of a friend near Tavistock-square, and while standing upon a balcony outside a first-floor window, and leaning over it, the front gave way, and he fell upon the rails of the area below. Mr. Simon attempted to save himself by springing forward, but, unfortunately, he was caught by the sharp points, and they entered his abdomen, and caused fearful injuries. Wounded as he was, Mr. Simon managed to extricate himself from his terrible position, and he was at once conveyed to University College Hospital, Gower-street; but the case was hopeless, and after lingering for three days he died. Mr. Simon was about twenty-eight years of age, and a man of talent and promise. Shortly before his death he was preparing for the press a volume on a subject connected with his profession.

A Music-hall burnt down at Derby.—The "Star Music-hall and Theatre of Varieties," Derby, has been burnt. When the fire was first noticed the whole of the inside of the building, which is some 50 ft. high, was on fire. The flames spread with such rapidity that in less than one hour the entire building was gutted and destroyed. The roof, which consisted of galvanised iron, fell in with a tremendous crash, shortly after which the boundary walls also gave way and fell in. The hall, was capable of holding several thousand people.

Fall from a Scaffolding in Swansea.—The scaffolding of a Wesleyan chapel in course of erection in St. Helen's-road, Swansea, gave way, and three workmen, who fell from a height of 26 ft., were seriously injured. One sustained concussion of the brain, and is not expected to recover. The building was blown down in a storm some time ago.

Fatal Accident to Halil Pasha.—The *Levant Times* announces the death of Halil Pasha, Grand Master of Artillery, at his town residence, at Pera. His Excellency has been rebuilding his konak, and he took an active personal part in the superintendence of the work. As he was going over part of the building, some material became dislodged, and, falling upon him, he stumbled, when, before he had time to recover himself, he was knocked down by a fall of large

stones which descended on his head, and killed him on the spot. Halil Pasha was educated at Woolwich, and, speaking our language fluently, he was well known among our countrymen. He had a strong predilection for English workmen, of whom he had introduced a considerable number into the Imperial establishments under his direction, as well as for English manufactures. He used to say, indeed, that he considered himself an Englishman, and, what was more, an "English mechanic."

POWER OF SURVEYORS' CERTIFICATE.

SIR,—About two years ago we constructed a main sewer for the Toxteth Local Board of Health, along Aigburth-road, near Liverpool; and during the execution of the work several of the properties on the line of road were, by the orders of the owners, and under the cognizance of the Surveyor to the Board, connected with the main sewer by our putting in branch drains. The whole of these branches were put in during the progress of the work, at junctions sanctioned by the surveyor, and were therefore open to his further inspection, and for all of which we have been paid, except in one instance, and being unable to get paid for this, we have had the matter tried in the County Court; the defendant, who is a member of the above Local Board, refusing to pay unless the surveyor certified that the work was properly done. At the trial the surveyor, who was present on behalf of the defendant, said that he knew from defendant, and also from us, about the drain before it was done, and that he knew something had been done, "but could not say whether the work was done or not done," and he withheld his certificate until he was satisfied that the work was done properly, although he had passed the whole of our accounts for work in connexion with the sewer and drains against both his own Board and the private individuals. Of course, we were nonsuited.

Now we beg to submit the above case to you, and to ask what course we should take to obtain this valuable document, the "Certificate"? Are we to open up the sewer, to show the surveyor that the drain is there, when either himself or his clerk of works was constantly on the works when the contract was being executed, and *ought*, if they *did not*, to have seen this drain as well as the others that have been paid for? JOHN ANWELL & SON.

Liverpool.

A WATER-TIGHT FLAP.

SIR,—Among your numerous readers possibly there may be a man of genius who knows how to make a water-tight basement flap? If so, I recommend him to make known his whereabouts. I have had considerable experience in paying builders, and I have the honour to employ an architect with five letters attached to his name intimating that he is in connexion with some distinguished Institute, but each and all "give it up" after a series of experiments in attempting to keep the wet out of a basement. INQUIRER.

SEWER VENTILATION.

THIS is an important subject, often treated of and with many suggestions, in our columns during the last thirty years, but still in an unsettled and unsatisfactory position. The withdrawal of the sewer-gases through rain or other pipes to the bedroom or upper stories of houses is one of the many suggestions referred to, as also is the construction of special shafts for districts or towns, to carry the gases up beyond the imminent risk of befouling the air of our sleeping-apartments, and even to "consume" them on the way, by help of furnaces, or, at least, by rarifying them, to hasten their departure into the general atmosphere thereby. The decomposition of sewer-gases by deodorisers in the sewer-gratings is another mode of getting rid of these vile effluvia; and some or all of these suggestions have been tried; but still the question how best to get rid of our sewer emanations is an unsettled one.

A contribution towards this very desirable and important end has been recently made by Mr. R. J. Johnson, of Peckham, builder, who has patented an apparatus for rarifying *or* consuming sewer-gases by means of heat while passing through iron or other suitable pipes either in connexion with house-drains, and running up behind grates or ranges to the tops of houses; or in connexion with the sewers, through special shafts provided with furnace arrangements, on the plan of his apparatus.

It is probable that the solution of the problem may be both mechanical and chemical in combination; that some such apparatus as Mr. Johnson's, combined with proper chemical means for really decomposing, and so consuming, the sewer-gases while thus under the favourable influence of adequate heat, may effect the purpose in view, but this would not be very practicable in house arrangements, and could only apply, on the great scale, to districts or towns. If it be proved that heat applied in the way proposed will not merely rarify, but will, chemically, thoroughly, and without fail, decompose the stench-gases, then no harm might arise from vomiting forth the proceeds more or less on a level with house-roofs; but this is a chemical question. That heat in combination with chemicals *can*, with fitting apparatus, be made to thoroughly decompose, or "consume," such abominations as sulphuretted and phosphoretted hydrogen, &c., there can be no doubt; but whether any heating apparatus can be so applied to dwellings as practically to decompose, and so destroy, such emanations must be tried and proved by actual experiment.

BUXTON EXALTED.

BUXTON "of the Peak" and its neighbourhood have found another panegyrist. Mr. James Ballantyne, whose poems are as well known in Scotland as his painted glass, having been freed by its wells, its baths, and pure fresh air

"From painful, wrenching misery,"

has filled two columns and a half of the local *Advertiser* with his song of admiration. Speaking of *Haddon Hall*, he makes a spirited offer to the owner of that interesting domain:—

"We pass through village and through town,
And many scenes of old renown
Where Druids prayed, where Romans fought,
And where brave Britons freedom bought.
And now we reach old Haddon Hall,
A glorious pile beloved by all;
Alas! what pain it must impart
To every lover of Old Art,
To see this palace, once so gay,
Neglected—crumbling to decay.
The grand oak panels, friezes, walls,
That grace these grand baronial halls,
Left to the grubs and devastation
Without attempt at preservation;
The gorgeous tapestries, too, wasting;
The whole to utter ruin hasting.
Come, wealthy Duke of Rutland, come,
And make this Hall once more your home;
Or, if you won't, give it to me,
And such a glorious fane you'll see
That all the Rutlands would be fain
To have it for their home again."

Chatsworth delights him, and thus he sings:—

"But come, another Hall we'll seek,—
Chatsworth, the 'Palace of the Peak';
Behold it 'mid its vast surroundings,
With forest, hill, and river boundings,
The verdant parks, the herds of deer,
The birds in myriads warbling clear;
The Derwent as it rills along,
Melting in floods of liquid song;
The mountains clothed with forest trees,
Serging and dancing in the breeze;
The gardens,—gems of Paxton's skill,
Have ne'er been matched, and never will;
Then enter this rich home of art,
Crowded with gems in every part:
Ancient and modern works combined
Delight the eye and charm the mind.
Sculpture and painting each come wooing,
As if each for your love were suing;
As if, like rival swains, they strove
Which should first win your virgin love;
And while on these bright gems you gaze,
Emitting such transcendent rays,
You cannot fail to love the art
That fills these halls in every part;
Ceilings and walls, and flowers all blending,
Each to each other beauty lending.
Wood, jasper, marble, silver, gold,
In varied forms these charms unfold;
And while from fairer climes they come,
When placed beneath this genial dome
They seem, each in the proper place,
The Palace of the Peak to grace."

If ever we visit the writer's house, we shall expect to see on his sideboard a wide-spreading salver of silver, legibly inscribed,—

"*From Buxton to Ballantyne.*"

TRADES GUILD OF LEARNING.

A CONFERENCE is to be held on Saturday, the 14th of June, at the Society of Arts, Adelphi, for the purpose of establishing this guild, and determining its constitution; the chair will be taken at eleven a.m. by Mr. Morley, M.P., and at three p.m. by Mr. Mundella, M.P. It is stated that a number of gentlemen have engaged to attend, "but whether the movement is carried further will depend upon the attendance of the working men themselves at the conference." The means proposed are:—

"1. The formation of classes for practical instruction in various trades, in art workmanship, and in scientific knowledge, both theoretic and practical, connected with those trades. 2. The delivery of courses of lectures, accompanied with questions to and from the students, and followed by voluntary examinations. 3. The holding periodical discussions, *conversazioni*, and social meetings. 4. The giving prizes for essays, poems, songs, &c., to be read, recited, and sung at stated festivals of the guild. 5. The formation of libraries and reading-rooms, halls, and clubs (where the classes, lectures, &c., could be conducted); the establishment of museums, exhibitions of painting and sculpture, industrial exhibitions, art-workshops, &c.; and the utilisation of all such existing agencies. 6. The institution of scholarships and exhibitions for promising pupils in primary schools, to enable them to attend higher schools, instead of being sent to work at an early age; and, in exceptional cases, to send them to college. 7. The employment of a visiting or organising agent.

All these and similar means are to be used, as soon as possible, in conjunction with the Department of Science and Art, South Kensington; the Society of Arts; the Universities of Cambridge and Oxford; the Working Men's Club and Institute Union; the City Companies; Unions of Mechanics' Institutes; Trade Organisations; Co-operative Societies; and all other bodies desirous of promoting the technical and general education of the working-classes."

The object in view,—the promotion of Technical Education,—is an excellent one, but the present movement will require a good deal more talking about before there will be any chance of its being properly carried out.

GOOD SEED.

SIR,—The *Builder* has sown much good seed, and people are content to eat of the fruit of the plant, without asking to whom they owe it. The *Times*, in a recent excellent article on the state of things in France, reproduced one of the sound proverbs lately published in your pages,—"Woe to the nation that forgets its benefactors." You will not mind, I am sure, how often it is said. I hope it may have world-wide currency, and so prevent much evil,—"Woe to the nation that forgets its benefactors." SENEX.

LANDSLIPS AND NEW BUILDINGS.

NORSWORTHY *v.* THE REGENT'S CANAL COMPANY, and THE REGENT'S CANAL COMPANY *v.* NORSWORTHY.

THESE cross-actions have for a considerable time past engrossed the attention of builders leasing Crown lands on the banks of the Regent's Canal, as well as the legal profession and the law courts, and so important had the dispute become, regarding the law of landslip, as to necessitate the two cross-actions being stated in the form of a special case, for the opinion of the judges in banco, the Lord Chief Justice of the Court of Common Pleas (Bovill), and Justices Grove, Keating, and Brett.

The digest of the case submitted to the learned judges was, that Mr. Norsworthy leased Crown lands abutting on the Regent's Canal, and here he had constructed a terrace of houses with gardens. As far back as February, 1867, a landslip of the gardens occurred that precipitated the wall and part of the earth into the Regent's Canal. As the Regent's Canal Company had nothing to do with the Crown lands abutting their property, and considered they were in no wise answerable for the mishap, and the canal itself being stopped by the fall of the wall and the earth, they at once claimed damages of the builder and lessee (Mr. Norsworthy), and urged that the cause of the landslip was by the percolation of rain-water through the terrace-gardens, and the additional weight imposed on the banks of the canal by the new terrace and the wall; and action was taken to recover damages.

The answer to this claim was an action brought by Mr. Norsworthy against the Canal Company, for that it was through the percolation of the water from the canal that the Crown lands had become a water-bed, and rendered unsafe to build upon.

An arbitrator having been appointed, that official examined practical men produced on each side, and his award was "that the damage was not caused by any act, neglect, or default of either party."

A long array of counsel now argued from each point of view, and the learned judges, not liking the case, endeavoured at an early stage of the argument to get the litigants to agree to a *stet processus*, *i.e.*, an order to stay proceedings.

Having had so much expensive law, the builder was averse to this unsatisfactory mode of settling the dispute, and so were the Canal Company, and each side agreed to "have it out."

The Court at length gave judgment for both sides, holding that neither Mr. Norsworthy nor the Regent's Canal Company had made out any case, and confirmed the award of the arbitrator.

As to the ruinous costs, Mr. Norsworthy can claim his in the action brought against him, and the Regent's Canal Company can claim theirs in the action brought against them by Mr. Norsworthy.

Such is the result of "going to law"!

NEW PUBLIC SCHOOLS FOR CHESTER.

A NEW project is being matured at Chester for the management and improvement of the King's School, including the erection of new school buildings. The scheme has been approved of by the Committee of Council on Education, and by a public meeting recently held, at which arrangements were made for collecting subscriptions.

Upon the tables of the Council Chamber, where the meeting was held, were copies of the design by the architect engaged, Mr. Arthur Blomfield, M.A. According to the plans of this gentleman, which have met with general approval, the school buildings will occupy, almost exactly, the site of the late episcopal palace, as erected by Bishop Keene, and added to by Bishop Blomfield and others; including the old Gateway of the Abbey, the upper floor of which will be restored, and converted into a head master's class-room. The principal front will be to Northgate-street and St. Werburgh-street; and, while in keeping with the Cathedral itself, will also harmonise, save in the colour of the stone, with the new Town-hall on the opposite side of the square. The main entrance will be at the

angle of the two streets, and the building will be set back at this point, so as to still farther open out the view of the Cathedral from Northgate-street. Supposing the design to be carried out, there will be, in passing in to the right under the groined porch, on the left of the principal staircase, a class-room, about 27 ft. by 21 ft., lighted by three windows from the open playground on the north-east; a lobby on the right of the staircase leading to the south wing, where the cap and cloak room and other offices are situate; and thence, by a flight of steps, a descent to the groined cellar of the late palace, which, being an interesting relic of the abbot's house, has been retained, and will be appropriated to a lavatory, with the addition of a boys' yard on the north side. Returning to the entrance-hall, a lobby, flanked on the left hand by the porter's rooms, leads into the covered but well-ventilated playground, measuring about 52 ft. square; this would be mainly of use during wet weather, and between lessons for the purification of the class-rooms. The large open playground would form a continuation of the covered one, and occupy a large part of the garden of the old palace; bounded on the north side by Abbey-square, and on the west by the cloisters and Abbott's-hall. To the westward of the covered playground would be another room, 27 ft. by 13 ft., at present also allotted to the porter, and lighted by one good window to Northgate-street, and by two small openings and a doorway through the south wall of the Abbey-gate. The staircase to the head-master's class-room would be at the south-east corner of the old gateway; this would form a commodious room, 32 ft. by 28 ft. pleasantly lighted both from Northgate-street and Abbey-square. Through a door at the top of this staircase, the head-master would have access to the great school, about 82 ft. by 34 ft., having six windows to Northgate-street, four towards the playground on the east side, and two in the angle in St. Werburgh-street. A door at the west end of the great school would lead through a lobby to another good class-room, over the one upon the ground floor, and to the south wing, occupied by a long corridor, and three other convenient class-rooms—the great staircase in the angle leading back to the entrance-hall.

Mr. Blomfield's estimate for the building is 12,000*l.* But since he gave it, building materials have risen in price, and for labour something must be added. There are 3,000*l.* for the existing palace, and to the 15,000*l.* may be added 5,000*l.*, so that the sum required is estimated at 20,000*l.* Towards that there are already 9,000*l.*, and of this 7,000*l.* are available for building,—that is, 5,000*l.* given by the Ecclesiastical Commissioners and 2,000*l.* from Owen Jones's Charity. It is thought safe in beginning to build if 5,000*l.* more can be added to the amount in hand.

THE PROJECTED SCIENTIFIC COLLEGE FOR THE MIDLAND DISTRICT.

WE have stated that Sir Josiah Mason, who has already built and endowed an orphanage at Erdington, near Birmingham, at a cost of more than a quarter of a million, has now arranged to erect and endow a scientific college in Birmingham, on which will probably be expended at least an equal amount. All the arrangements for this munificent gift have been completed, according to the *Derby Advertiser*. The site has been secured, and the deed of foundation duly enrolled in the Court of Chancery. The first clause in the deed furnishes a brief sketch of the founder's life. He was born at Kidderminster (February, 23, 1795), and from his earliest youth was engaged in earning his livelihood. He was first a shoemaker, then a baker, and then a carpet-weaver at Kidderminster. He was introduced into his present business of steel split ring and key-ring making, in Birmingham, "by his good friend, Samuel Harrison, the first inventor of steel split rings." He added to it the manufacture of steel pens. In 1842 he entered into partnership with Mr. G. R. Elkington, as electro-platers and gilders, under the firm of "Elkington & Mason," and then in the business of copper smelting, under the firm of "Mason & Elkington." This partnership was dissolved in 1858. During his long experience as a manufacturer, Mr. Mason became deeply convinced of the want of, and necessity for, "thorough scientific instruction, specially adapted to the practical, mechanical, and artistic requirements" of the Midland district, and this want he has determined to devote a portion of his remaining property to supply.

The institution is to be called "Josiah Mason's College," or "Josiah Mason's College for the Study of Practical Science." A preparatory school may be added to the college, and the instruction to be given is strictly confined to subjects specially adapted to the "practical, mechanical, and artistic requirements" of the Midland district, more particularly the boroughs of Kidderminster and Birmingham. Regular systematic instruction is to be given in mathematics, abstract and applied; physics, both mathematical and experimental; chymistry, theoretical, practical, and applied; the natural sciences, especially geology and mineralogy, with their application to mines and metallurgy; botany and zoology, with special application to manufactures; and physiology, with special reference to the laws of health. The English, French, and German languages will also be taught. The trustees have power to include mechanics, architecture, and all other necessary subjects. Provision is made for lectures and classes, open to all persons, "without distinction of age, class, creed, race, or sex." Preference is to be given to candidates, "otherwise eligible," who have been, or are at the time inmates of Josiah Mason's Orphanage. The college will be open to qualified persons of all classes who have to rely on science, art, or manufacture for a livelihood, "especially the more intelligent youth of the middle class." The site selected for the college is in Edmund-street, Birmingham. It is in the centre of the town, and close to the Townhall, the Central Free Libraries, the Midland Institute, the new Post-office, and the proposed Corporation buildings. The land therefore is of the greatest value, and the founder has already laid out upwards of 20,000*l.* on the site alone.

AN ORDER OF THE GUARD.

IN a country where patriotism is keen, there will always be men on "the watch" in all matters affecting its welfare, and in affairs quite distinct and apart, very frequently, from their own professional vocations,—men who, for the most part, have no desire to enter the arena of politics, but who are gifted with the genius of *prevision* in special directions,—"seers" in the true sense of the word; with the clearer *prevision*, perhaps, because not paid to perform the special duty, or because their attention is unbroken by the calls of *routine*, and their thoughts are unhampered by the mass of detail, as the attention and thought of the officers of any special department of the State inevitably must be. Such men are not unfrequently of great service to the country, but are nevertheless generally overlooked and neglected by the ruling powers. No one can predict where this foresight, where this spirit listeth, till it manifests itself. It is, therefore, for the recognition of such men, and for the purpose of enrolling them as a corporate body under one banner, that I solicit a little space in your widely-circulating journal, to propose an order of "The Guard." I feel convinced that the annals of such an order would be filled with records of great and glorious services to the State.

VIDETTE.

Books Received.

Transactions of the Society of Biblical Archæology. London: Longmans & Co. 1872. Vol. I., Part II.

THE second part of the first volume of the Transactions of the Society of Biblical Archæology contains a number of interesting papers. The first is on Cypriote inscriptions, by Samuel Birch, LL.D.; and there are others on Cyrus, the Son of Cambyses, King of Persia. by J. W. Bosanquet, F.R.A.S.; on Assyrian Mythology, by H. F. Talbot, D.C.L.; on the Origin of Semitic Civilisation, by the Rev. A. H. Sayce, M.A.; on Jerusalem, by W. Simpson, F.R.G.S.; on the Base Length of the Great Pyramid, and the Dimensions of the Royal Coffer, by S. M. Drach, F.R.A.S.; on Egypt, before the Reign of Ramses III., by Dr. Eisenlohr; and various others. The volume is illustrated with maps and numerous examples of Cypriote, Egyptian, and Assyrian inscriptions, &c.

On Coal, at Home and Abroad. By J. R. LEIFCHILD, M.A. London: Longmans.

THIS volume relates to the consumption, cost, demand, and supply, and other inquiries of present interest in reference to coal; and is a reprint of three articles contributed to the *Edinburgh Review*, with an Appendix. Mr. Leifchild is the author of other works on coal and mining. The first article relates to the consumption and cost of coal; the second to the mineral itself, and the coal-fields of North America and Great Britain; and the third, chiefly to coal mining and its accidents in the North of England. The author also offers a forecast as to the future cost and supply of coal, of interest to the general public.

VARIORUM.

THE current number of the *British Workman* gives an interesting notice of a self-taught wood-carver, Marshall George Strapps, now acting as postman in Wisbeach. It serves to show what may be done by perseverance. He is engaged at this time on a very elaborately carved chair, which, judging from an engraving of it, is superior to what we usually obtain under such circumstances, and not to be confounded with the cathedrals formed out of corks and similar trivialities sometimes put forward by admiring and ill-instructed neighbours. The chair is 6 ft. in height, and includes numerous subjects from the New Testament illustrating the life of the Saviour. Not the least satisfactory part of the relation is, that Mr. Strapps (though he has had a family of fourteen children, nine of whom are living) has contrived to save money enough to buy the little house in which he lives, as well as a plot of building land through a building society.——According to *Nature* the "Fishmongers' Company have presented to Mr. W. K. Parker, F.R.S., well known for his valuable researches on the Foraminifera, the shoulder-girdle, and skull in vertebrated animals, the sum of 50*l.*, in addition to an allowance of 20*l.* a year for the next three years, in order to enable him to pursue such parts of his work as relate to the anatomy of fishes." This is a good precedent for other of the great City companies to follow. ——Mr. Richard A. Proctor, B.A., Hon. Sec. of the Royal Astronomical Society, has contributed an article on "The Approaching Transits of Venus," to the June number of *Cassell's Magazine*.——Part VI. of *Old and New London* is occupied chiefly with St. Paul's, and is an interesting number.——The *Art Journal* says,—"The Royal Academy diploma of Sir Joshua Reynolds—then Mr. Joshua Reynolds—was sold last month, and purchased by Messrs. Graves & Co., for 'the small sum' of 6*l.* Why it was not purchased by the Royal Academy for their library is a mystery not to be explained. It is dated the 15th December, 1793, and is signed by George III. It was sold at the sale of a curious collection of 'remnants,' the property of Joshua Reynolds Gwatkin, Esq., deceased, the great-nephew of the painter who is England's chiefest glory in art. Messrs. Graves purchased at the same sale a matter even more curious. It is a small book, bound in vellum, containing twenty pen-and-ink sketches of much merit, picturing Windsor Castle, Holyrood, and other places, and is the note-book of the secretary of James II., then Duke of York, in which were entered the expenses incurred *en route* from London to Edinburgh—the Royal party, including the Duke's first wife, Anne Hyde, leaving London on the 27th October, 1679; the cost of the journey to Edinburgh being 832*l.* 11s. 7½d. In a pocket of the note-book was found a lock of hair, of a light brownish tint, and on the paper that encloses it is written in Sir Joshua's hand, 'Lady Waldegrave,'—the Lady Waldegrave of whom he painted a portrait. His picture of her three daughters is his *chef d'œuvre*. She was afterwards Duchess of Gloucester. It is recorded by Mr. Tom Taylor, that when Sir Joshua was working at the portrait, he asked the lady for a lock of her hair, that he might get the true colour with accuracy. She gave it, and after a lapse of 112 years the identical lock is thus accidentally discovered."——"More-street, now Moor-street, Liverpool; its Origin and early Associations. By Henry Ecroyd Smith. Brakell, printer, Cook-street, Liverpool." This reprint, from the Transactions of the Historic Society of Lancashire and Cheshire, contains some particulars of interest in the history of an old street in Liverpool. We thank Mr. H. E. Smith.

Gift of a Church.—On Wednesday morning Earl Fitzwilliam laid the foundation-stone of a new church, his lordship's own gift, at Wentworth, near Rotherham.

Miscellanea.

The Sewage Farm at Fazakerley, Liverpool.—The farm of 200 acres acquired by the West Derby Local Board, for the utilisation of sewage on the irrigation system of Mr. William Hope, of the Romford sewage farm, is being brought into operation. The amount paid for the land, compensation to tenants, legal and other charges, was 36,000*l.*; and the cost of the construction of a culvert, the levelling and laying out of the ground, the bringing the sewage on to the farm, and other expenses, was estimated at 22,700*l.* Borrowing powers for 58,700*l.* were obtained, the principal to be repaid in thirty years, and 4½ per cent. was paid for the money. About the middle of last year operations began on the farm, under the superintendence of Mr. Hope, who was assisted by Mr. Orridge (surveyor to the local Board) and Mr. William Avis (superintendent under Mr. Hope). Of the 200 acres of land, 180 are intended, at present, for irrigation by sewage. About 165 acres are already drained, nearly 80 acres have been levelled, and 45 acres have been cropped with onions, carrots, mangolds, beans, turnips, and cabbages. The remainder of the land, with the exception of the 20 acres, will be cropped as soon as the levelling is finished, and the 20 acres are intended in time to receive the sewage of the eastern or least populous part of the district; but, of course, additional land will have to be acquired. Eighty men are labouring on the ground at various points. The farm is intended to utilise the sewage of 17,000 persons.

The Condition and Ventilation of the Liverpool Sewers.—A special meeting of the Local Health Committee has been held for considering the report of the borough engineer upon the condition and ventilation of the sewers. Dr. Taylor occupied the chair, and the mayor was also present. Some of the recommendations of the report were adopted, and a discussion took place as to the sixth,—

"That the system of drainage in question having been put into good condition, gratings be fixed on the manholes in the streets; or, in the absence of manholes, that ventilating shafts in the streets be constructed at distances not greater than 100 yards."

Dr. Trench, the local officer of health, was against the recommendation, and stated that Mr. Rawlinson and other well-known scientific men had condemned it. The borough engineer, however, said he had been in communication with the gentlemen named by Dr. Trench, and that the general opinion was in favour of the system adopted in London. He quoted the subsequent opinion of Mr. Rawlinson in favour of his proposal, and in course of which Mr. Rawlinson had said,—

"In reply to your questions, I beg to say that I consider main sewer ventilation of the utmost importance,—that, in fact, sewers without ventilation are unwholesome sewage-gas retorts, which gas, in its concentrated form, is deadly. Main sewer ventilators to the open streets, as in London—one such ventilator on each 100 yards in length,—should be provided."

Mr. Forwood referred to the introduction of Archimedian screws, and said that if they were adopted throughout Liverpool, 17,600 would be required, and estimating them at 11*l.* each, the total cost would be 193,600*l.* The meeting was then adjourned.

The "Opera Comique."—Every now and then the theatrical critics of the daily papers take it into their heads to vary the ordinarily good-natured style of their notices by "pitching into" some piece produced under circumstances that do not happen to please them, with an edifying unanimity. This has been the case with the *opéra bouffe* now played here, "The Wonderful Duck," very cleverly imitated from the "Canard à Trois Becs" by Mr. Charles Lamb Kenney. Judged of from the *opéra-bouffe* point of view, it deserved better treatment, and unless we are mistaken, this opinion will be justified by a long run. It was poorly played, with some exceptions, on the first night, but the cast has been strengthened, and the actors (Mr. George Honey, Mr. Odell, Miss Patty Laverne, Miss Rose Bell, and others) are getting hold of their parts, which enables them at the same time to take hold of the audience. Mr. Kenney has executed his part of the business admirably. There is a good deal of real fun in the piece, and some of the music is so charming, and is now so well sung, that the audience are not satisfied with hearing it twice. "The Wonderful Duck" will have a flight, notwithstanding the arrows that were feathered from its wing.

The Twenty-second Annual Report of Amalgamated Society of Engineers, &c.—The General Secretary, Mr. Allan, states in his remarks that during the year the council has opened thirteen new branches—eleven in England; one in Scotland; one at Kingston, in Canada; and one at San Francisco, California. So that at the close of the year the society had 351 branches, with 41,075 members, 5,294 having been been admitted during the twelve months. They have been enabled to add to their previous balance no less than 41,987*l.*, thereby making their total accumulated fund at the end of December last 158,313*l.* or 3*l.* 17*s.* 1*d.* per member, being the highest amount per member they have been possessed of (except in 1866) since the formation of the society. The total income during the year amounted to 105,373*l.*, to which must be added 116,326*l.*, that being the balance in hand at the commencement of the year, making a grand total of 221,704*l.*, and during the same period the expenditure amounted to 63,390*l.*, thereby leaving a clear balance of 158,313*l.*, as stated, in favour of the society. The sum of 15,377*l.* has been paid as donation benefit to unemployed members, including 6,000*l.* expended in trade disputes. In support of sick members 18,563*l.* have been expended. In eleven cases of accident, &c., 100*l.* have been paid to each. The funeral benefits have amounted to 6,273*l.*

Results of the High Price of British Iron.—At the last weekly meeting of iron-masters in Wolverhampton, it was notified that a consumer of finished iron, carrying on business in the midst of the iron-rolling mills of that district, had made arrangements to import from across the Atlantic 1,000 tons of strip-iron made in America; further, that the firms who manufactured railway-axles in America are selling axles at 3*l.* per ton under the prices, in American markets, of the leading railway-axle companies of South Staffordshire. In West Yorkshire all sorts of prices have been asked and given during the past week when any iron could really be met with. The dearth of the metal, however, has been almost unprecedented. Prices of Cleveland iron are simply nominal, although work has been resumed in the meantime, with the view of arbitration. In the Scotch market there is substantially no change as regards values, but that is a sign of weakness rather than otherwise. Merchants and consumers fail in obtaining lower prices; for the ironmasters insist on their published quotations, knowing that very soon consumers will be forced to buy on the best conditions which the state of the supply will admit of.

Sanitary Report on Whitechapel.—The Board of Works, Whitechapel District, report on the sanitary condition of the district for the quarter ending March 29th, 1873, by Mr. John Liddle, medical officer of health, has been issued in a printed form. The total area of the Whitechapel District is 406 acres, or 1,965,040 square yards; and the population at the last census, according to the report, was 76,332. The water area of the district is 23 acres. The density of the population is therefore 25·7 square yards for each inhabitant. The deaths, excluding those of non-residents and those which were the result of accident, were, for the quarter, 2,023, which gives a death-rate of 26·4 per 1,000. This rate of mortality, however, varies in different sub-districts. Thus, in a block of buildings, bounded on the north by the south side of Royal Mint-street; on the east, by the west side of Dock-street; on the south, by the north side of Hog-yard; and on the west, by the east side of Glasshouse-street, the rate of mortality was 43·3 per 1,000,—a sad difference. We hear of a recent outbreak of illness in the district.

The Whitehall Approaches to the Thames Embankment.—An opinion appears to be entertained in the Westminster Board of Works, that additional approaches are needed from Whitehall to the Thames Embankment. At a special meeting, a proposition has been made, having for its object the opening of an approach by way of Derby-street, but after considerable discussion the consideration of the subject was adjourned.

A Right Suggestion.—We are glad to hear that a movement is on foot, with a view to the presentation of a personal testimonial to Mr. Henry Cole, C.B., on his retirement from the duties he has so long successfully performed at South Kensington. A preliminary meeting of gentlemen interested in the promotion of it is to be held, this, Friday, June 6th.

Exeter Cathedral. — The London fund towards the restoration of Exeter Cathedral now amounts to about 1,200*l.*, and it is proposed to close that, as also the Oxford fund. The amount originally required for the restoration was 35,000*l.*, viz., 25,000*l.* for the choir and that part of the edifice east of the organ, and 10,000*l.* for the nave. The sum promised through the Chapter amounted to 21,100*l.*, which, with the city fund, would make a total of nearly 31,000*l.* Over 4,000*l.* are still required. To the contractor has been already paid for work done 14,779*l.* It is proposed to do much more work than was at first contemplated. The bishop's throne will cost 500*l.* and the organ 800*l.*,—double the outlay originally intended. In addition to this, there are special funds for the restoration of the Lady Chapel at the sole cost of Lady Rolle, of Bicton, the four memorial windows to the late Bishop Phillpotts for the Lady Chapel; the memorial window for the east end, and two pulpits, the cost of which will be 1,000*l.*, as a memorial of the late Bishop Patteson. The entire restoration when completed will thus cost about 40,000*l.*

Ravensthorpe Main Drainage.—On the 11th of May an inquiry was held at Ravensthorpe by Mr. Robert Morgan, C.E., one of the inspectors attached to the local government office, for the purpose of receiving evidence touching a proposal for putting into force the Lands Clauses Consolidation Act, with reference to taking about 1¼ acre of land for sewage outfall purposes. The scheme adopted by the Local Board comprises the complete main drainage of the district into a receiving-tank, and hence the sewage will be pumped with an ultimate view to utilisation by irrigation. The natural difficulties caused by the low level of the ground, and liability to floods from the river Calder, have hitherto deterred the board from undertaking the work. The cost of the scheme, including main outfall sewers, tank, overflow, and pumping works, is estimated at 6,700*l.* The engineer, Mr. Malcolm Paterson, of Dewsbury, and others, gave evidence at the inquiry. A provisional order from the local government office, authorising the purchase of the site, has been received by the Board.

Archæological Discoveries at Humbledon Hill.—The summit of Humbledon Hill, about 300 ft. above the level of the sea, about half a mile west of Bishopwearmouth, has been chosen as the site of a high level reservoir for the use of the Sunderland and South Shields Water Company, and in the course of the needful excavation for the works, several interesting remains were discovered. Two sun-dried urns have been found, which were in an inverted position, and filled with bones, in fragments. These urns are supposed to be of ancient British origin, belonging to the Brigantes. The wheel has not been used in their manufacture. Excepting on the neighbouring heights of Tunstall Hills, and at Trimdon, no instances have occurred in the county of Durham of the finding of urns of a similar kind. The urns have been presented to the Borough Museum by the directors of the Water Company.

Drinking-Fountain and Cattle-Trough Association.—The fourteenth annual meeting of this association has been held at Willis's Rooms, with a larger attendance than on any previous occasion. The Marquis of Westminster, president of the association, was in the chair. The committee's report for the past year stated that the year's subscriptions (annual) amounted to 1,315*l.* odd, and the donations to something over 2,140*l.*, besides a legacy of 500*l.* from the executors of the late Mrs. Jane Lyon. The expenditure exceeded 2,962*l.* The committee have in some cases to pay as much as 30*l.* a year for the water consumed in a single trough; and they point out that, without the liberal support which they solicit—the society depending entirely on voluntary subscriptions—it will be "impossible for them to sustain and extend a work, the beneficent effects of which are experienced by many millions of human beings and animals every year."

A New Memorial Hospital.—The friends and congregation of the late Rev. W. Pennefather having determined to erect a memorial of him, it is proposed, if the fund collected should admit of it, to found a hospital for women and children,—in other words, to extend and enlarge the plan of the present children's nursing-home at Mildmay Park, Islington.—*The Rock.*

Moving a Girder by the Sun.—A girder of the bridge now constructing at Kuilenborg (Holland), which rested about 2 in. too far on one of its piers, has (according to the *Chron. de l'Ind.*) been moved into its proper position by a means not unknown in this country. By a variation of temperature of the girder, which is about 465 ft. long, 1° C., it was found to expand about 1-14th of an inch; the difference of the temperature of the air by night and by day amounting to 18° C. In the morning the girder was securely fastened at the end, where it rested too far forward, and in the evening, when in consequence of the rise of temperature during the day, it had moved forward about 1 in. at the opposite end, it was fastened to this, but set free at the other, so that it might contract during the night. By repeating the proceeding, the girder was got into its proper position.

Proposed Press Cable between America and Great Britain.—A large meeting of the members of the New York Cotton Exchange was held in New York on the 11th ult., to discuss the proposition of the *Journal of Commerce*, that the press of America should combine to lay an ocean cable for telegraphic purposes, and to devise means for encouraging such an enterprise. The President of the Exchange occupied the chair. Appropriate resolutions were passed. Mr. Graner said that one million sterling would be sufficient to make and lay a cable, and that amount could be raised in a week. Messages could be sent for 25 cents a word, and then pay an enormous profit. Merchants could then transact a much larger part of their business by telegraph, and be sure of prompt dealings.

New Fuel.—Mr. L. Banks, of Hull, proposes a new manufacture of fuel. The invention relates to the combination of the following matters:—1. The refuse which accumulates round the mouths of coal-pits. 2. Small coal. 3. Turf, peat, or such like matter. 4. Mineral pitch. 5. Coal-tar. 6. The scum or refuse from cotton seed after obtaining oil-cake therefrom. The coal-tar and the mineral pitch are prepared by being mixed whilst hot, and after being boiled in the ordinary manner in equal proportions. The two are then run together; before use they are reboiled and mixed with the other ingredients before named. The whole are then compressed together by steam-power or otherwise, and the composition is then ready for use.

Damaging the Ruins of Dudley Castle. At the local police-court two boys were summoned for unlawfully damaging the ruins of Dudley Castle. A watchman in the employ of the Earl of Dudley stated that he saw the two defendants upon the highest portion of the triple gateway. He called to them, and immediately afterwards he found that a man had been seriously injured. A large stone, weighing upwards of 20 lb. had struck him and rendered him insensible. As it appeared to have been an accident, a penalty of 5s., damage 6d., and costs, with the alternative of fourteen days' imprisonment, was inflicted. It is just such sixpenny damages, however, that cause our interesting historical remains gradually to disappear altogether.

Shop Architecture in Newcastle.—New business premises have been erected in Clayton-street for Mr. Barrass Grant, hatter. The work has been carried out from designs by Mr. George Lambton, architect, Newcastle, and superintended personally by him. On either side of the shop is a cornice, carried by Corinthian pillars, with carved capitals, the cornice being broken above the pillars, on the top of each of which is a raised chamfered block. Over the rear of the shop is a gallery, reached by one of Macfarlane's spiral staircases; the balcony railing, by the same maker, is of simple design. The fittings of the windows are of brass.

Report of the Ladies' Sanitary Association.—The fifteenth annual report of this Association has been published at their office, 22, Berners-street, Oxford-street. It states that many ladies have joined the Association during the past year, and that its publications are becoming more extensively useful. In all, 45,500 tracts have been issued, making a total of 823,340 since 1857, which cannot fail to have much extended the public knowledge on sanitary subjects. The committee earnestly urge the co-operation of friends in the distribution of these tracts and the collection of funds.

Society for the Encouragement of the Fine Arts.—Mr. H. C. Selous delivered a lecture on "Form and Motion" before the members of this Society, on Thursday evening in last week, when Dr. Doran, F.S.A., presided. The lecture was illustrated with diagrams, showing the form and action of the various portions of the human body, and considerably interested the audience. It is complained, and with some justice, that long speeches, often entirely irrelevant, are made here after the lectures, which only serve to remove the good impressions produced by the lecturer and chairman.

Attempt to Blow up a Statue.—A Dublin correspondent telegraphs that an attempt has been made to blow up the statue erected to the memory of the late Viscount Fitzgibbon, on Wellesley Bridge, Limerick. A barrel of gunpowder had been placed on the pedestal, and ignited by a long fuse. The statue is happily not much injured, but the explosion displaced the top stone of the pedestal. No arrest has been made. The statue was erected after the Crimean War, Viscount Fitzgibbon having fallen at Balaklava.

Milton Abbas Cottage Hospital.—This institution was recently built by Baron Hambro, for the welfare of the people on his estate of Milton Abbey. The hospital gives assistance in case of sickness (not infectious) and accident, and midwifery cases are admitted. Patients may be recommended for approval of the medical officer by subscribers of 10s.; and those admitted are required to contribute towards their own maintenance. There is no restriction as to religious visitation.

Dover Harbour.—The engineer's report on the Dover breakwater, or western arm of the harbour of refuge, a work which he describes as begun a quarter of a century ago, shows that at the end of March, 1873, the expenditure had reached 671,434*l.* There had also been 14,646*l.* expended upon the substructure of the fort for the War Department. Will some one who knows be so good as to say *when* the harbour will be finished, and how much must be expended before that consummation will be arrived at?

"Smoking and Thinking."—We are told that the article under this heading, which appeared in our last, had already been published elsewhere. The MS. had been in our hands many months, and the author of it now informs us, with apologies, that, supposing we had given up the intention of printing it, he sent a duplicate to another journal.

Oxford Architectural Society.—The members and friends of this Society made an excursion on Saturday before last to Rollright Stones, Lyneham Camp, and the churches of Shipton-under-Wychwood, Chipping Norton, &c.

TENDERS.

For sundry repairs and painting to the Great Synagogue, St. James's-place, Aldgate. Mr. N. S. Joseph, architect:—

Vernell	£725	0	0
Hurn	646	0	0
Kinymont	528	6	0
Hopkins	497	0	0
Heeps (accepted)	480	0	0

For supplying fittings and fixtures at the new Vestry-hall, for the parish of St. Giles, Camberwell. Mr. E. Power, architect:—

Sage	£1,450	0	0!
Drew	1,190	0	0
Sadgrove	1,105	0	0
Shapley	820	0	0
Ramsey	780	0	0
Tonson & Williams	772	0	0!

For house at Anerley, for Mr. A. W. Chauner. Mr. W. G. Bartleet, architect. Quantities by Messrs. Stoner & Ashby:—

Pritchard	£1,767	0	0
Wood	1,688	0	0
Downs	1,596	0	0
Blake & Ramplen	1,540	0	0
Adcock & Rees	1,452	0	0

For excavations for warehouse, Blackfriars. Messrs. Smith & Seymour, architects:—

Green	1,500	0	0!
Goodman	900	0	0
Mansbridge & Co.	700	0	0
Batch	595	0	0
Hilton	500	0	0
Hubbard	377	0	0
Irons	360	0	0!

For the erection of a house at Orpington, Kent, for Mr. G. Allen. Messrs. T. & W. Stone, architects. No quantities:—

Lathey, Brothers	£1,220	0	0
Goodman	1,220	0	0
Kiddle & Sons	1,180	0	0
Payne & Balding (too late).			

For villa residence, Plot 12 E, Crystal Palace Park Estate, Sydenham. Mr. J. Norton, architect:—

Taylor & Sons	£2,690	0	0
Oliver	2,631	0	0
Coles	2,417	0	0
Sand & Simpson	2,300	0	0
Blake & Ramplen	2,279	0	0
Keastand	2,225	0	0
Elliott	2,197	0	0
Tibbett	2,055	0	0
Aitchison & Walker	2,025	0	0
Moore	1,997	0	0
Blackmore & Morley	1,990	0	0

For erecting workshops and chimney-shaft in rear of No. 13, Greek-street, Soho. Messrs. Lee, Brothers, & Pain, architects:—

Tilly	£2,013	0	0
Pain (accepted)	2,010	0	0

For alterations, &c., to the Rectory House, Brinkley, Newmarket. Mr. Frederick Thomson, architect. Quantities by Mr. W. Barnett:—

Bell & Sons	£1,097	0	0
Taylor	993	0	0
Thoday	950	0	0
White	795	0	0
Mason & Son (accepted)	714	10	0
Mason & Fell	662	10	0

For repairs at Duke of Abercorn, High-street, Kensington. Mr. H. J. Newton, surveyor:—

Brindle	£150	10	0
Shurmur	149	0	0
Taylor (accepted)	147	0	0

For alterations at the Tollington Arms, Hornsey-road. Mr. Waghorn, architect:—

Steed	£449	0	0
Carter	390	0	0
Terrey	345	0	0
Chapman	342	0	0

For infants' school and dormitory at the Stockwell Orphanage, Clapham-road. Mr. J. Cubitt, architect:—

Keyes & Head	£1,272	0	0
Thompson	1,147	0	0
Rider	1,053	0	0
Tarrant	1,050	0	0
Colls & Son	1,036	0	0
Hart	1,028	0	0
Cullum (accepted)	998	0	0

For a farmhouse and homestead at Quinbury Farm, Braughing, Herts. Mr. Robt. Hutchinson, architect:—

Ginn	£2,478	0	0
Glasscock	2,400	0	0
Ekins	2,348	0	0
Lawrence	2,338	0	0
Cade	2,300	10	0
Lord	3,295	0	0
Cornwell	2,238	0	0
Dover	2,195	0	0
Wildman	2,171	0	0
Allen & Smith	2,079	0	0
Gibbons	1,937	0	0

For new buildings at King-street, Covent-garden, for Mr. Henry Butler. Mr. Alfred Cross, architect:—

Patman & Fotheringham	£6,748	0	0
Candler	6,670	0	0
Newman & Mann	6,516	0	0
Perry & Co.	6,300	0	0
MacLachlan	6,297	0	0
Clemence & Sons	6,200	0	0
Howard & Co.	6,175	0	0
Hart & Co.	6,071	0	0
Wilson, Brothers	5,979	0	0

For new stable in Montague-street, for Mr. Stanley. Mr. Sandall, architect:—

Howell	£212	0	0
Croaker	189	0	0
Green	149	15	0
Linfield	149	0	0

For lodge to The Cedars, Enfield. Mr. T. J. Hill, architect:—

L. & W. D. Patman	£375	0	0
Bayes & Ramage	363	0	0
Fairhead	363	0	0

For additions, &c., to premises, High-street, Barnet, for Mr. Schlencker. Mr. T. J. Hill, architect:—

Paterson	£285	0	0
Miller	277	0	0
Baughan	260	0	0

For a house, Church-road, Upper Norwood. Mr. S. Dyball, architect:—

Stevenson	£3,006	0	0
Newman & Mann	2,836	0	0
Manley & Rogers	2,627	0	0
Daymond	2,563	0	0
Sabey & Son	2,426	0	0
Wright (accepted)	2,349	0	0
Coles	2,286	0	0
Bryan (too late)	2,280	0	0

For proposed additions at St. Mary's schools, Paddington, for the Rev. John Wall Buckley and others. Mr. T. R. Parker, architect. Quantities supplied:—

Temple & Foster	£519	0	0
Ebbs & Sons	500	0	0
Morsman	490	0	0
Cross & Son	480	0	0
Oldrey	420	0	0

For proposed additions at Munster House, Fulham, for Messrs. Blandford, Hemming, & Williams. Mr. Thos. R. Parker, architect. Quantities supplied:—

Goodman	£4,028	0	0
Webber	3,974	0	0
Smith	3,937	0	0
Stimpson & Co.	3,900	0	0
Smith & Alder	3,846	0	0
Cross & Son	3,837	0	0
Adamson & Sons	3,786	0	0
Aviss & Co.	3,786	0	0
Wigmore	3,700	0	0